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Environmental Management Report, Region IV (Pilot Project): Attachments A and B

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Attachments A and B

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ENVIRONMENTAL MANAGEMENT REPORT

REGION IV

(PILOT PROJECT)

ATTACHMENTS A AND B

NOTE: This report was prepared
primarily as an internal document.

MAY 1983

REGION IV ENVIRONMENTAL MANAGEMENT REPORT
ATTACHMENTS A AND B

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Region IV
ENVIRONMENTAL MANAGEMENT REPORT
PILOT PROJECT
Attachment A
Medium-by-Medium Overview

INTRODUCTION

1. Geography

The highest elevation (Mt. Mitchell at 6684 feet above msl) and the lowest elevation (sea level) east of the Mississippi River are located within Region IV as well as 16 percent of the nation's inland water surface and 2034 miles of coastline. This results in a diversity of ecosystems ranging from the Canadian life zones of the Appalachian Mountains to the subtropics of south Florida. Each must be regarded as unique with specific qualities to be considered when dealing with pollution abatement.

Geomorphically, the Region has three dominant provinces, the Mountains, the Piedmont, and the Coastal Plain, and numerous sub-provinces (Fig. D-1). One of the world's largest supplies of easily exploited, high quality bituminous coal is found in these mountains. Most of the rivers in Region IV originate in the Mountains and pass through the Piedmont before discharging into either the Atlantic Ocean or the Gulf. The juxtaposition of headwaters and industrial discharges create a historically bad water pollution problem notably in western North Carolina, Kentucky, and eastern Tennessee. The situation has improved since the enactment of the Clean Water Act, but acid mine drainage and paper mill effluents are still major problems to be addressed.

The Piedmont contains the bulk of the South's industrial development and large cities. In addition to the normal pollution associated with industries and cities, erosion has been a serious problem evidenced by stream turbidity, sedimentation, and the transport of nutrients and agricultural chemicals into surface waters. The famous "red clay" of the Southern Piedmont is really a laterized subsoil which by requiring extensive fertilization to produce successful crops compounds non-point source pollution.

The Fall Line is a definite demarcation between the Piedmont and the Coastal Plain. The sudden drop in gradient has lead to the construction of many dams, reservoirs, and electric power plants. Because much of the Coastal Plain is valuable as agricultural land, most of the native forests have been removed and wetlands have been drained. The streams and rivers are sluggish and meandering. Silts from the Piedmont tend to settle here. Since the early 1800's, deposition has caused swamps to be formed where once streams flowed. Natural waters are characteristically "tea" colored with a high pH. Many streams have been dammed to form innumerable small agricultural ponds. Because of the warm climate, sluggish waters, and a high nutrient level, aquatic weeds, which have long been a problem in Florida, are becoming problems in other states. Land use changes have lead to an increasing nutrient level in surface waters.

In summary, Region IV is characterized by extreme variations in landforms, ecosystems, and economic activities. Thus, the approach to environmental protection must be versatile and site specific.

2. Demography

A rapidly increasing population and an expanding industrial base have reversed the socio-economic characteristics of Region IV. At one time, Region IV had a negative net emigration and an agricultural based economy. Region IV now has the nation's highest rate of immigration and has a service/manufacturing based economy. As a result, most measures of economic viability are approaching the national averages.

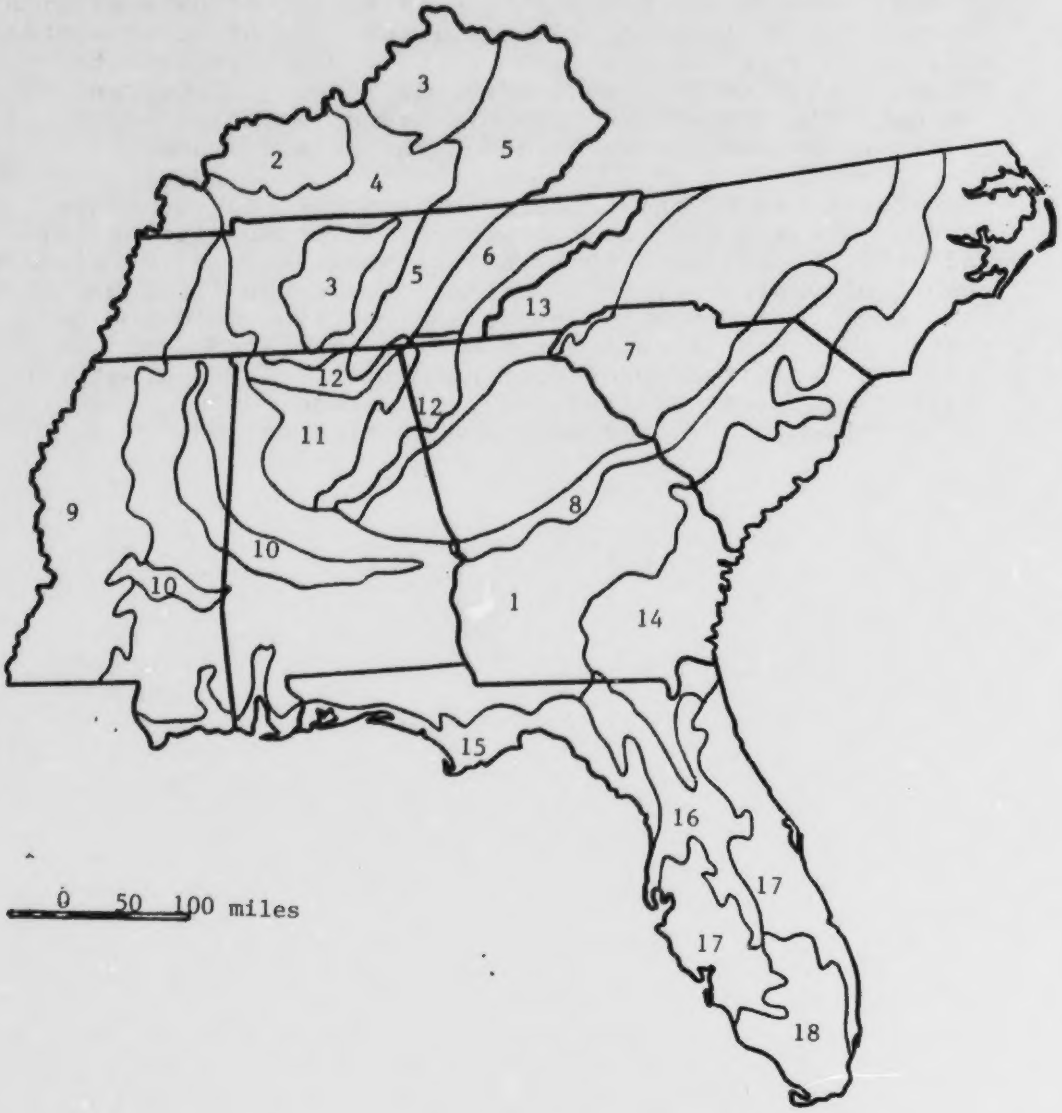
Regional population increased 22 percent (from 31.9 to 38.9 million) between 1970 and 1980. Interregional immigration accounted for 55 percent of this increase while natural increases and resident population retention accounted for the remainder. Population projections for the years 1980-2010 show a 30 percent increase in Region IV compared to a national projected growth of 21 percent (Figures D-2 and D-3). The growing population will generate air, water, and solid waste pollution problems to which the increasingly older age group will be more sensitive. Projected land use changes will add to the pollution problems. For example, the protection of water supply watersheds in rapidly developing areas is becoming a major water quality issue in North Carolina.

Population and manufacturing earnings in Region IV's coastal counties parallel the projected growth for their states, and their share of state population and earnings is projected to be stable between 1978 and 2000 (Tables D-1 and D-2). Mississippi is the only state whose coastal counties are projected to grow at rates greater than the state's growth rate for both population and earnings. In all states except North Carolina, coastal Standard Metropolitan Statistical Areas (SMSA) have a larger share of population and earnings than non-SMSA counties and will generate the greatest environmental impacts in Region IV's coastal areas. However, the non-SMSA counties could suffer significant impacts as population and industry grow over the next 20 years. Coastal growth will affect every EPA program to some extent.

One measure of pollution abatement effectiveness is the quantity of pollutants eliminated by manufacturing sources. The U.S. Bureau of the Census has conducted annual surveys of such sources which show the elimination of 68.5 million tons of air pollutants, 259.5 million tons of solid wastes, and, since 1978, 11.5 million tons of water pollutants. These quantities represent 13.9, 22.9 and 16.1 percent of the nation's respective totals. Trends in pollutant elimination have been stable for the past 2 years.

Estimates of the number of firms that may generate hazardous waste show a 16.3 percent increase between 1973 and 1978 (from 34,053 to 39,616 firms). When categorized by number of employees, 79.2 percent of the new firms had 20 or less employees. Most of these small firms would not be regulated since the amount of wastes generated would be less than that required for reporting purposes. The growth of these small firms has reduced the average number of employees per firm by 7.0 percent in this time period.

Figure D-1. Geographic Provinces of Region IV



1 Southern Coastal Plain
2 Kentucky Sandstone & Shale
3 Kentucky Bluegrass & Nashville Basins
4 Highland Rim & Pennyroyal
5 Western Appalachian Plateaus & Cumberland Mountains
6 Northern Appalachian Ridges & Valleys
7 Southern Piedmont
8 Carolina-Georgia Sandhills
9 Southern Mississippi Valley
10 Ala.-Miss. Blackland Prairies
11 Sand Mountain
12 Southern Appalachian Ridges & Valleys
13 Blue Ridge
14 Atlantic Coast Flatwoods
15 Gulf Coast Flatwoods
16 Central Florida Ridge
17 Southern Florida Fleetwoods
18 Florida Everglades

TABLE D-1
Region IV's Coastal Counties Population Growth

	Percent of State Population			Percent of Increase 1978-1990		1978-2000	
	1978	1990	2000	Coastal Counties	State	Coastal Counties	State
Alabama	11.6	12.0	12.1	11.4	8.4	17.8	13.6
Florida	80.6	80.4	81.2	29.1	29.3	48.7	47.6
Georgia	6.4	6.2	6.2	8.6	12.4	19.8	22.9
Mississippi	12.2	12.9	13.0	18.7	12.7	32.2	24.0
North Carolina	9.3	9.3	8.9	13.0	12.7	18.1	23.2
South Carolina	21.3	21.4	21.2	15.3	14.6	24.9	25.9

TABLE D-2
Region IV's Coastal Counties Manufacturing Earnings Growth

	Percent of State Earnings			Percent of Increase 1978-1990		1978-2000	
	1978	1990	2000	Coastal Counties	State	Coastal Counties	State
Alabama	9.7	9.6	9.6	63.6	64.5	121.1	123.8
Florida	78.8	77.8	77.7	67.3	69.3	136.8	140.2
Georgia	7.3	6.2	6.1	44.2	70.8	89.9	127.8
Mississippi	20.2	23.0	23.7	110.1	84.1	210.9	177.1
North Carolina	4.1	4.1	4.0	60.5	61.4	111.7	118.8
South Carolina	10.8	10.5	10.9	61.5	67.1	136.7	134.6

TABLE D-3

INDUSTRIAL GROWTH

	Past or Projected Time Period	Region IV	National
Employment Increase	1969-1978	27%	18%
Employment Increase	1978-2010	50%	37%
Manufacturing Employment Increase	1969-1978	16%	2%
Manufacturing Employment Increase	1978-2010	45%	16%
Industrial Earnings Increase	1978-2010	209%	167%

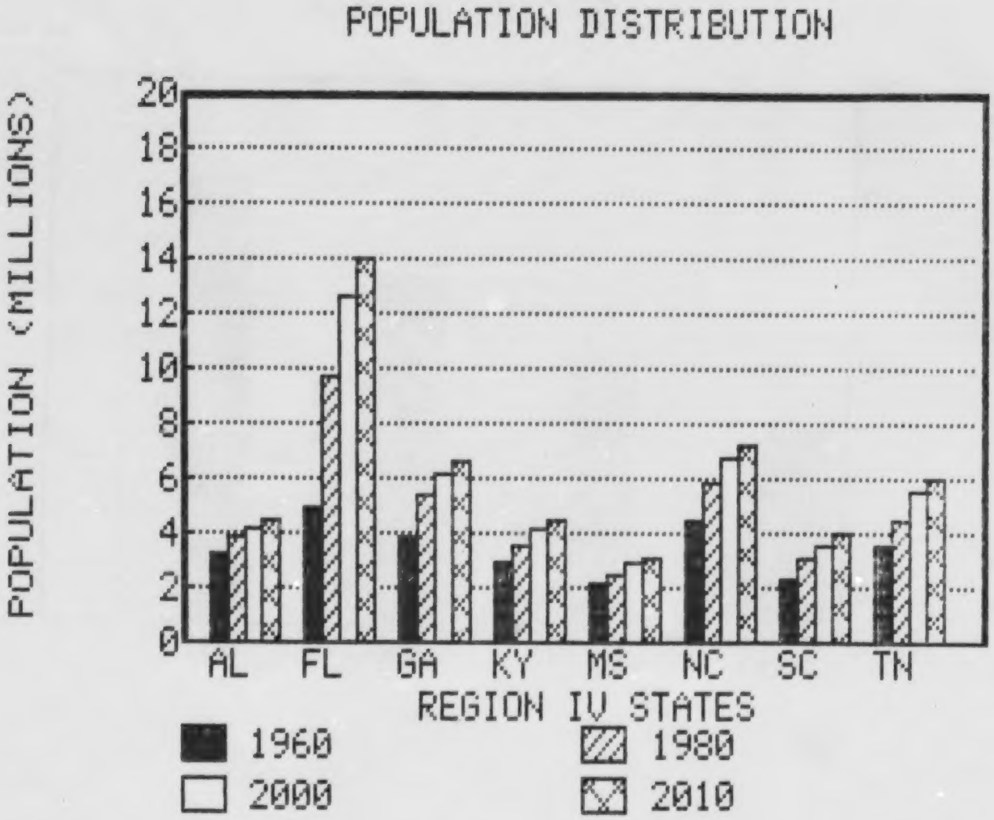


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Figure D-2

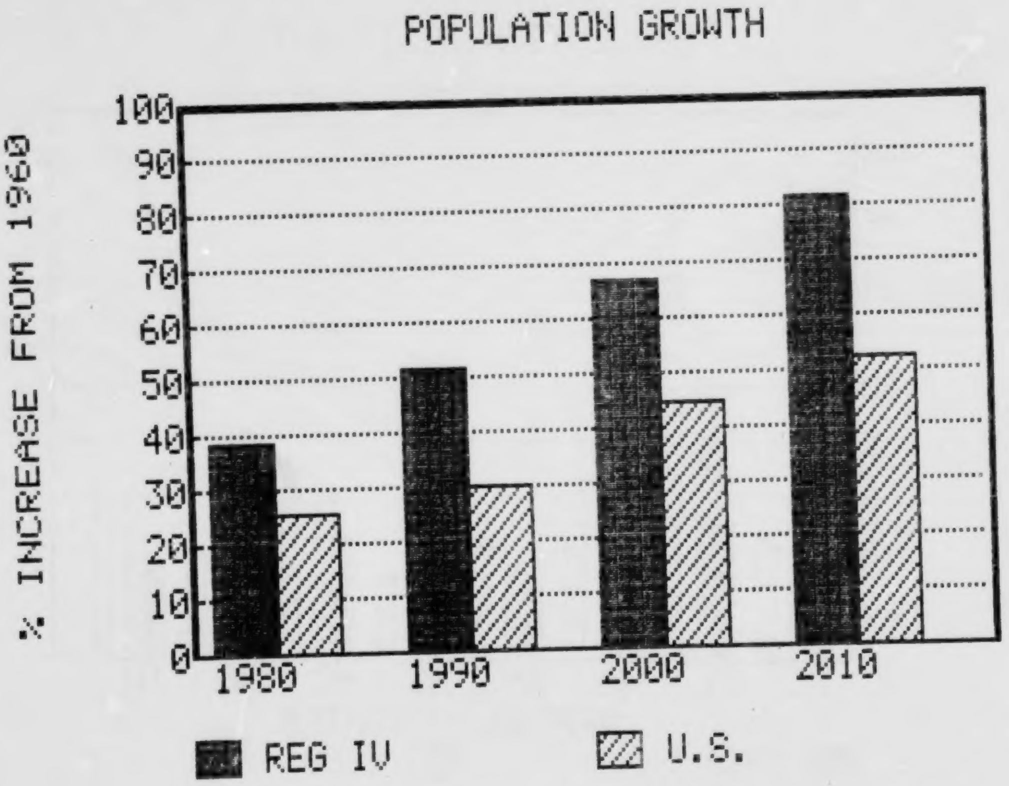

POPULATION GROWTH
% INCREASE FROM 1960
100
90
80
70
60
50
40
30
20
10
0
1980
1990
2000
2010
REG IV
U.S.

Figure D-3

AIR QUALITY

1. Goals of the Clean Air Act and Overall Regional Progress

The primary goal of the Clean Air Act is to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population.

Great progress toward this goal has been made in Region IV over the last decade. Air pollution from stationary sources has been greatly reduced. Figure AQ-1 displays a trend indicating that the air quality is steadily improving for the criteria pollutants. The major problems requiring further work are nontraditional sources of particulate emissions, stationary sources of volatile organic emissions, vehicle emissions, and traditional pollutants in a few areas.

The evaluation of trends in air quality and emission data should be tempered with an understanding of trends in the economy over the past few years. National steel production is at 30% capacity and total national industrial production is at 70% capacity. Figure AQ-2, Yearly Production or Shipments for Certain Industries as a Percentage of 1979 Data, shows significant decreases in production. These data are from the 1983 U.S. Industrial Economics, U.S. Department of Commerce. A relationship exists between industrial output and measured ambient air quality concentrations and plant emissions, so there are significant decreases from 1980 through 1982. The emissions have generally decreased in Region IV, partly because of a reduction in industrial output.

The majority of sources emitting total suspended particulates installed control equipment during the initial phase of State Implementation Plan (SIP) control strategies in the early 1970's. Most 1979 particulate control strategies for nonattainment areas demonstrated that nontraditional sources were the most significant contributors to the problems. Because of the impending promulgation of an inhalable particulate standard, EPA shut off funds for studying possible controls on these nontraditional sources. Consequently, many areas have made little progress in attaining the total suspended particulates standard.

Major hydrocarbon or volatile organic compounds sources have installed emission controls resulting in significant reductions in emissions. Many stationary sources have extended compliance schedules.

2. Status of Ambient Air Quality in Region IV

a. Current and Projected Nonattainment Areas

(1) Carbon Monoxide (CO)

The Region has five post-1982 nonattainment areas for CO. The states have submitted 1982 SIP revisions which indicate that these areas will not come into compliance until sometime after 1984. In addition to the post-1982 areas, six other counties may have difficulty in meeting the CO standard in 1984 because they had violations of the CO standard in 1981 and 1982. Historically, the growth rate of emissions from mobile sources has been around three percent per year, and the Federal Motor Vehicle Emission Control Program (FMVCP) reduces emissions by only about the same percentage. Thus, it is projected that if an area was violating the CO standard in 1981 or 1982, the area could still be violating the CO standard in 1984 (Figure AQ-3). This assumption may be conservative because of the present recession, which creates an atypical decrease in vehicle miles traveled. In effect, the FMVCP is probably going to offset slightly the growth of actual emissions until economic recovery occurs, and concentrations of CO are likely to begin to decrease in the near future. During the next several months the Region will be doing a thorough analysis of these six additional areas with the state/local agencies to more clearly define which ones should be designated nonattainment.

(2) Ozone

The Region projects that several counties will not be attaining the ozone standard in 1984 (Figure AQ-4). However, the Region plans to conduct a thorough analysis over the next several months to ascertain if these projections should be changed (also see discussion under Rural Ozone Nonattainment).

(3) Sulfur Dioxide

Based on analysis of the Ambient Air Quality Data, all areas in Region IV met the sulfur dioxide standards by December 31, 1982 (Figure AQ-5).

(4) Total Suspended Particulates

The number of counties not meeting the total suspended particulates standards has also greatly declined. The majority of the remaining areas are in Kentucky, where the problem is believed to be related to fugitive dust from haul roads. The Region is also working with Tennessee and Alabama to resolve their remaining problem areas. (Figure AQ-6).

b. Monitoring Areas and Measured Data

Figures AQ-7 thru AQ-12 indicate, in general, that the Region IV ambient air quality is good and shows an improvement during the period of 1977-1981 which should continue. As the various monitoring programs and policies of the state and local air pollution control agencies are refined and improved, the quality of, and confidence in, the Regional ambient air quality data submitted to the SAROAD data bank by these agencies will be increased.

Stating that the data show good and/or improved ambient air quality does not preclude the fact that problems exist in attempting to interpret these data. Factors such as changes in primary and/or secondary standards, changes in siting criteria, changes in site locations, changes in personnel responsible for monitoring a particular site and changes in monitoring methodology and equipment contribute to the difficulty of interpreting status and trends of ambient air quality for specific geographic areas in the Region. Figures AQ-13 thru AQ-18 indicate there are numerous areas where monitoring is not being conducted. Additional monitoring for some of the criteria pollutants would provide a better data base from which to assess ambient air quality.

3. Status Of Lead and Nitrogen Dioxide

a. Lead

No areas in Region IV have been identified as nonattainment for the lead standard. However, violations of the standard have been measured at two sites in Alabama.

b. Nitrogen Dioxide

Generally, nitrogen dioxide has not been a significant problem in Region IV. In the late 1960's, the Chattanooga, Tennessee, area was chosen for an epidemiological study relating nitrogen dioxide to community health. The high levels of nitrogen dioxide were from the Volunteer Army Ammunition Plant which is no longer operating. Also, a few large urban areas, such as Nashville, do approach the nitrogen dioxide standard.

4. Source Emission Trends

Trends in emission data can provide insight and serve as a valuable indicator in the overall analysis of a particular area. However, it must be used in conjunction with other data, such as air quality monitoring and modeling, since emission data alone do not provide a complete picture. Over the past several years, a low priority has been set on maintaining the National Emission Data System, in which emissions data are kept. Consequently, EPA's current system is very suspect and lacking in completeness, and thus would not lend itself readily to use in trends analysis. Higher priority must be given to this activity.

5. Trends And Projection Of Nonattainment In Region IV

a. Total Suspended Particulates

Measured total suspended particulates concentrations have been decreasing in areas where significant controls were installed and where production has declined because of the recession. Numerous problems exist, however, and many new ones are anticipated. If EPA adopts an inhalable particulate standard there could be a significant reduction in the number of nonattainment areas.

b. Ozone

Ozone concentrations appear to be declining at many ambient monitoring sites; however, some sites are still experiencing high concentrations. Most ozone sites in southeast Florida (Broward, Dade and Palm Beach Counties) have not measured exceedances of the standard. Two Miami sites show violations of the standard. EPA policy defines an urbanized area as an area with a population of greater than 200,000 and must include adjacent fringe areas of development. Broward and Palm Beach Counties are adjacent to Dade County and are considered to be one contigious urbanized area.

Data for the Atlanta and Birmingham areas show slightly downward trends, but the trends cannot be given much weight because of the unreliability of short-term trends.

c. Sulfur Dioxide

Over the past ten years, ambient sulfur dioxide levels have decreased because of economic trends, improved compliance with State Implementation Plan emission limits, and taller stacks. Tall stacks have replaced short stacks at some older sources. A number of New Source power plants generally have built tall stacks. Numerous sources switched from coal to oil prior to the oil embargo, while others have installed scrubbers or purchased low-sulfur coal or gas. Dispersion modeling has been an excellent tool for predicting the amount of control needed to achieve the sulfur dioxide standard.

d. Carbon Monoxide

In many areas of the Region, ambient carbon monoxide concentrations appear to have decreased slightly, but there is no clear trend in the data. Some cities have extensions until 1987 to attain the standard and have therefore adopted vehicle inspection and maintenance plans. Carbon monoxide measurements in other cities--Miami, Fort Lauderdale, Knoxville, Chattanooga, Durham and Raleigh--will require further analysis. Such analyses may indicate a need for vehicle inspection and maintenance. Most sites are measuring exceedances of the 8-hour average carbon monoxide standard. Many sites have concentrations significantly over the standard and are measuring numerous exceedances each year. Unfortunately many sites have not been operating over a sufficient number of years or collected enough data during each year to show a definitive trend. Other cities have more historical data but also have dramatic year-to-year variations. Meteorological conditions have a tremendous influence on the data measurements so several years of data are needed to judge attainment.

6. Trends in Ambient Air Quality for Selected Sites

Review and evaluation of ambient air monitoring data reported from selected sites in eight major metropolitan areas in Region IV during the period of 1977-1981 indicates a trend toward improvement of air quality (Figures AQ-7 thru AQ-12). In addition to these specific sites, there was an overall Regional improvement in air quality for the same time period. The total number of violations of the National Ambient Air Quality Standards for five of the six criteria pollutants decreased during 1977-1981; the primary standard for nitrogen dioxide was not exceeded (Figure AQ-1).

7. Population Exposure

One of the stated purposes of the Clean Air Act is to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population. An assessment of Region IV population and land area exposed to nonattainment levels of criteria pollutants show decreased numbers in both categories (Figure AQ-19 and AQ-20). Population increases in nearly all nonattainment counties were offset by decreases in the number of nonattainment counties. In the case of ozone, the actual number of people exposed to nonattainment levels did increase but the percentage of the total Regional population exposed, decreased. In counties where only a portion of the county was designated as nonattainment, the total population and land area for the county were used for evaluation purposes.

Figures AQ-21, AQ-22 and AQ-23 identify the populations of the current and projected nonattainment areas. These figures indicate that for carbon monoxide and ozone, the areas affected are major population centers, which is logical due to the relationship of these pollutants to motor vehicles. The total population affected in Region IV is 9,763,000.

8. Corrective Actions

a. Improved Regulations

(1) Development of Generic Regulations

All States in Region IV except Mississippi and Florida have adopted or are developing generic Emissions Trading regulations as revisions to their State Implementation Plans. The regulations, when adopted by a State or local agency and approved by EPA, will enable the Agency to effect State Implementation Plan changes at the state level for many actions without prior EPA approval.

The major problems associated with developing EPA approved state generic regulations are related to air quality modeling procedures for total suspended particulates, sulfur dioxide, and carbon monoxide emission trades. Such emission trades often require modeling under EPA's proposed Emissions Trading policy statement (Level II modeling) and must meet the following conditions:

(a) no net increase in applicable baseline emissions;

(b) emission points involved in the trade can be modeled in a predescribed replicable manner. (To limit variability in modeling results, the generic rule must specify the models and modeling techniques that will be used in particular situations and the procedures for selecting input data. The models, techniques and procedures must be sufficiently defined to assure that trades will not create new ambient standards violations or interfere with the removal of existing violations.);

(c) no significant ambient impact. (i.e., the change in emissions after the trade does not cause an increase of more than 10ug over a 24-hour period for total suspended particulates 13ug/m3 [24-hr.] for sulfur dioxide or 575ug/m3 [8-hr.] for carbon monoxide at the receptor of maximum predicted impact).

Item (b) above is the major problem. EPA is working with state agencies to resolve the issues. EPA is experiencing some difficulty in devising modeling procedures that are sufficiently stringent and replicable, and can be used by all states.

The Office of Air Quality Planning and Standards and Headquarters EPA are working with Region IV to resolve this problem. PEDCO Environmental has been retained by the Office of Air Quality Planning and Standards to develop the required modeling procedures. The Office of Air Quality Planning and Standards has the lead in resolving the modeling issues. Considerable Regional resources are being used in this effort(six meetings between September 1982 and January 1983), and the expected completion date is April 1983.

EPA Region IV continues processing State Emissions Trading actions through the State Implementation Plan process; however, the request for such actions has declined since EPA issued its proposed Emissions Trading policy statement. Industry continues to benefit from application of more economical emissions control procedures under the bubble, and we expect increased activity in this area after EPA resolves the modeling problems and issues in its final policy statement.

More states will then adopt generic regulations for Emissions Trading activities and other State Implementation Plan actions. An increase in industry participation should follow EPA's approval of the states' generic regulation.

(2) Elimination Of Ambiguities In State Regulation

Elimination of ambiguities in state regulations will be resource intensive; however, probably less costly than allowing the regulations to remain unchanged. This is especially true when industry or others mount legal challenges to the regulations.

Many state compliance test regulations are written so industry sometimes does not interpret the regulations as the State or EPA interprets it. This is evident where visible emissions, fugitive dust and intermittent emissions regulations are involved. Testing of intermittent sources presents special problems, requiring considerable Headquarters assistance.

Consistency is not adequate between state Start-up, Shut-down and Malfunction Regulations. They lead to different interpretations regarding compliance status during the start-up, shut-down or malfunction periods.

(3) Improved Flexibility of Non-Generic Regulations

In the past, states have been required to revise their regulations based upon changes in EPA regulations. EPA and states anticipate resource reductions. It is critical that future state regulations not affected by generic regulations be as flexible but enforceable as possible to conserve resources. This flexibility should be given special attention when EPA changes in requirements do not affect air quality.

This flexibility could be very useful when EPA makes changes in its ambient or source monitoring procedures or source test procedures, and present state procedures are adequate. Moreover, if EPA revises a regulation, and its requirements are met in operating permits that are generic, the State Implementation Plan revision process for the regulation could be avoided.

b. Policy Changes

(1) Rural Ozone Nonattainment Areas

Present EPA policy requires that areas less than 200,000 population that are violating only the ozone standard adopt regulations for volatile organic compound sources greater than 100 tons per year. Further, non-State Implementation Plan demonstration is required. Over the next several months Region IV will be evaluating the adequacy of this policy to attain and maintain the ozone standard. Because of elevated ozone readings in 1981 and only having seen the first two quarters of 1982 data, the present policy may be inadquate; an evaluation will be sufficiently completed by May 1983 to ascertain if the current policy is adequate for Region IV. At this time plans are to make a specific recommendation to Headquarters on needed changes. The Region will also be looking at the present data recovery from the ozone monitors during the time a site should reasonably be expected to have violations of the standard. Plans are to work with the states and local agencies to assure a 75% data recovery for the 1983 summer ozone season. A review of the data indicates that, for both rural and urban site data, recovery is sparse. However, this may be due to the fact that data were only collected during the summer months.

(2) Newly Designated Nonattainment Areas

The current agency policy on newly designated nonattainment areas is to propose sanctions at the same time the proposed redesignation is made (February 3, 1983, Federal Register, Part VI c). The reasoning for this is that the State Implementation Plans are supposed to provide for attainment and maintenance of the ambient air quality standards. This approach should be reevaluated to consider when and where sanctions should be imposed, and when they should be discretionary. Throughout this report, several such newly designated nonattainment areas have been identified, making this a real situation in Region IV.

Policy decisions also must be made for what is required in a new State Implementation Plan for a newly designated nonattainment area or for current nonattainment areas that did not demonstrate attainment by December 31, 1982, i.e., Tier II areas. Will vehicle inspection and maintenance be required prior to adopting policy for State Implementation Plans required for non-attainment areas after December 31, 1982? These questions need to be resolved very quickly.

(3) Automatic Delegations And Adoption Of State Operating Permits

An emerging need in the area of delegations is the streamlining of delegations of New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants by allowing for automatic delegations. Several states are interested in establishing a procedure whereby when EPA adopts a new category for New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants, they automatically assume delegations. Present agency regulation/policy does not provide this mechanism.

Approximately one-third of the State Implementation Plan revisions could be eliminated by establishing policy/regulations providing for state operating permits to be federally enforceable without a State Implementation Plan submittal.

9. Emerging Air Quality Trends and Issues

a. Air Toxics

Based on proposed revisions to the Clean Air Act, it appears likely that the number of pollutants regulated under Section 112 will increase significantly from 4 to about 40. Requests from state/local agencies for technical information, EPA policies, and program implementation guidance regarding air toxics issues have steadily increased in number. In response to state/local needs, Region IV has initiated an Air Toxics effort.

This newly initiated effort calls for improved communication and coordination so that Region IV staff:

- Has a clear understanding of the needs and problems faced by state/local programs.

- Has full knowledge of the state-of-the-art in all aspects of Air Toxics (e.g., sampling, analysis, regulation development, program implementation, EPA policies, etc.)

- o Can establish the appropriate contacts at state/local programs, EPA at Research Triangle Park, and EPA Headquarters.

- o Can become familiar with other EPA Regions' efforts and success in the air toxics areas.

In addition, Region IV is undertaking the development of an Air Toxics Resource Center to provide answers to the many air toxics questions asked by Region IV states/locals.

In order to ensure a thorough review of energy projects' applications and help evaluate the emission of air toxics, EPA will continue to jointly review these applications along with the appropriate state agencies. Region IV will look to Headquarters and Research Triangle Park (Office of Research and Development) for emerging national policy, advanced control technologies, updating of the Best Available Control Technology/Lowest Achievable Emission Rate Clearinghouse, and health risk assessments of these pollutants.

Each state program in Region IV has requested guidance and technical assistance concerning:

- o Appropriate stack emission and ambient pollutant limits or the methodology for deriving appropriate limits.

- o Stack emission sampling methods with the corresponding analytical procedures.

- o Ambient air sampling methods with the corresponding analytical procedures.

- o Technical information regarding the synergistic effects of air toxics pollutants.

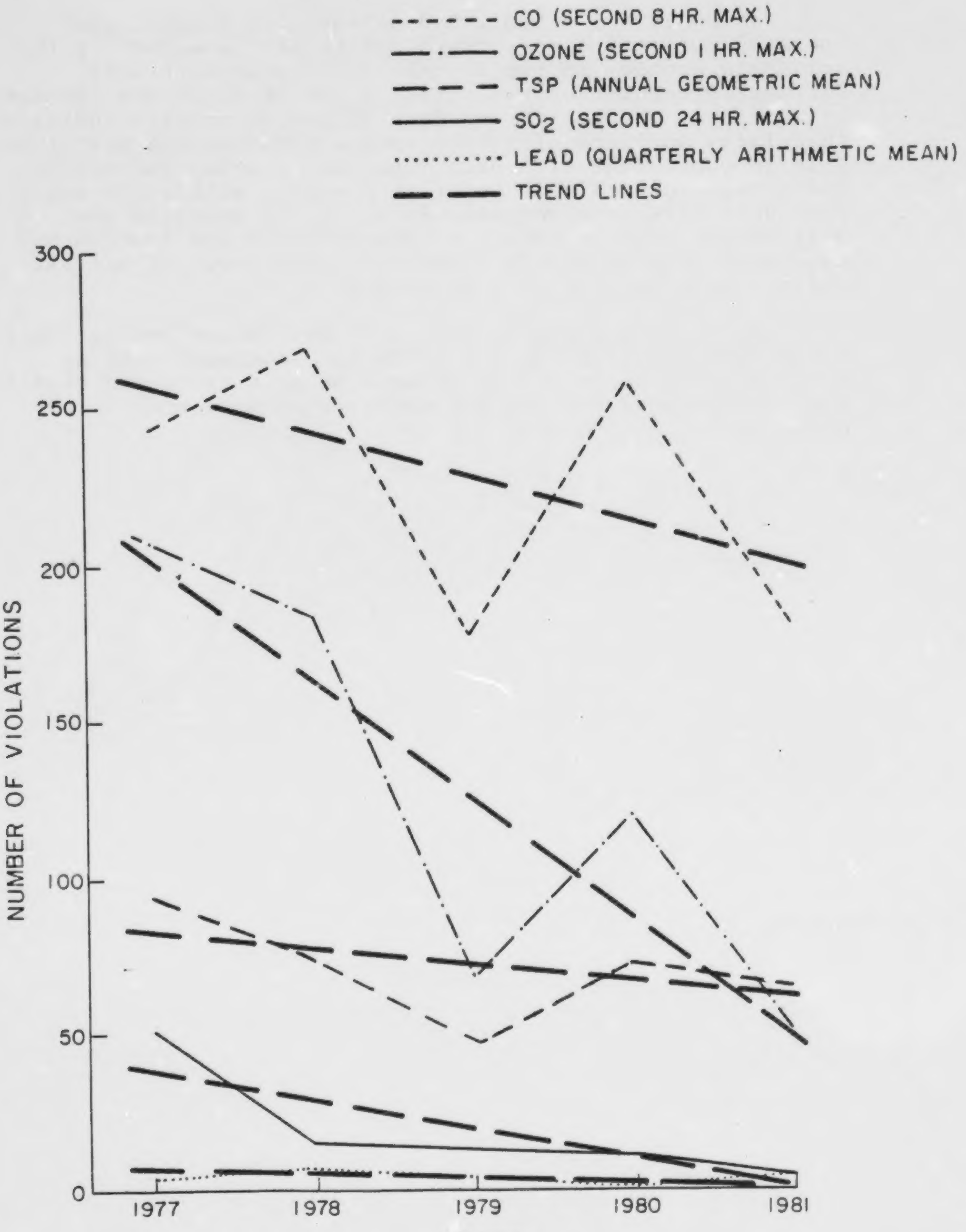
Provisions are not made in the annual work plan for air guidance or resources for monitoring for air toxics. EPA does, through ORD and other Headquarters Offices spend large sums of monies on developing contractor capability to monitor for air toxics. Some air toxic monitoring is done by the Region if the suspected source is a hazardous waste disposal site under Superfund, but if the suspected source does not fall under Superfund little or nothing can be done. Citizens' requests for air toxics monitoring are answered by a referral to their state agency. If a state decides to do air toxics monitoring at any place other than a hazardous waste site, the Region cannot support them in any meaningful way for lack of funds, equipment and personnel. Guidance and resources are needed.

b. Acid Rain

Region IV has established a Federally funded, state operated monitoring network to determine the extent of the acid rain problem in the Southeast. The network will ultimately consist of ten sites, eight of which are presently on line. The monitoring data collected to date indicate that large portions of Region IV are experiencing acid rain. This is consistent with data reported by other industrial and private groups which operate networks within the Region. During FY 1984, the compiled data will be analyzed and utilized in various models to characterize the sources and causes of acid rain. To accomplish this level of activity, additional resources will be needed.

Region IV's participation with TVA in the Southern Blue Ridge Province Study will provide the Southeast with an ecosytem evaluation of the effects of acid rain, and eliminate total dependence on effects research from much colder climates.

TRENDS IN VIOLATIONS OF NAAQS FOR CRITERIA POLLUTANTS IN REGION IV



*ALL SITES

Figure AQ - 1

YEARLY PRODUCTION OR SHIPMENT
FOR CERTAIN INDUSTRIES
AS A PERCENTAGE OF 1979 DATA

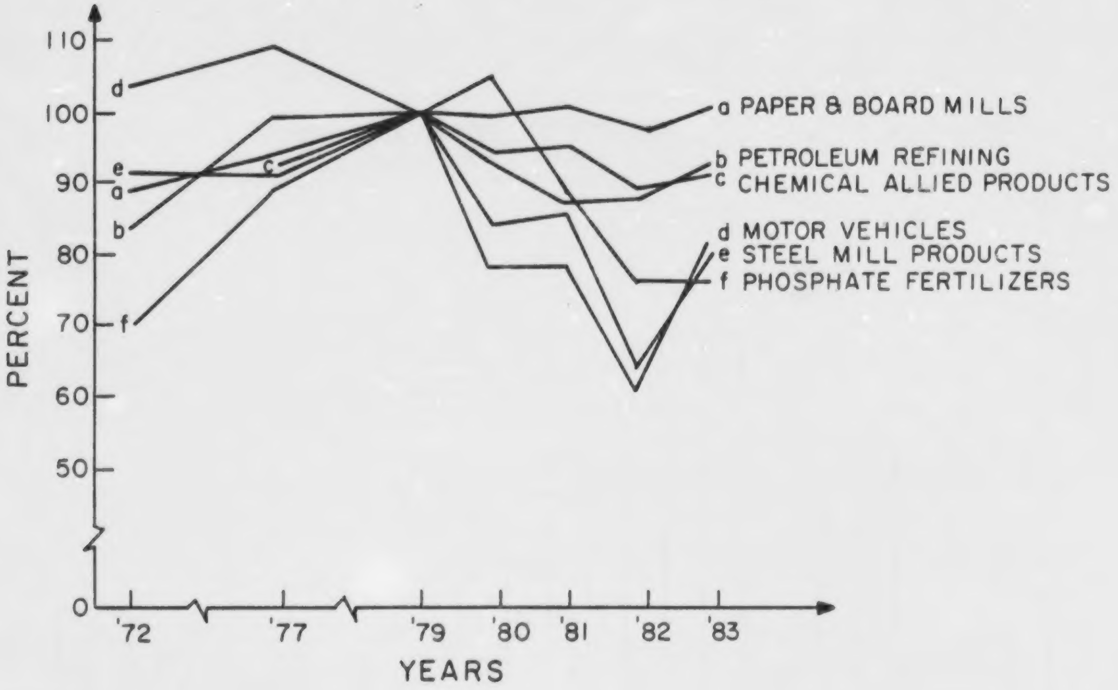


Figure AQ - 2

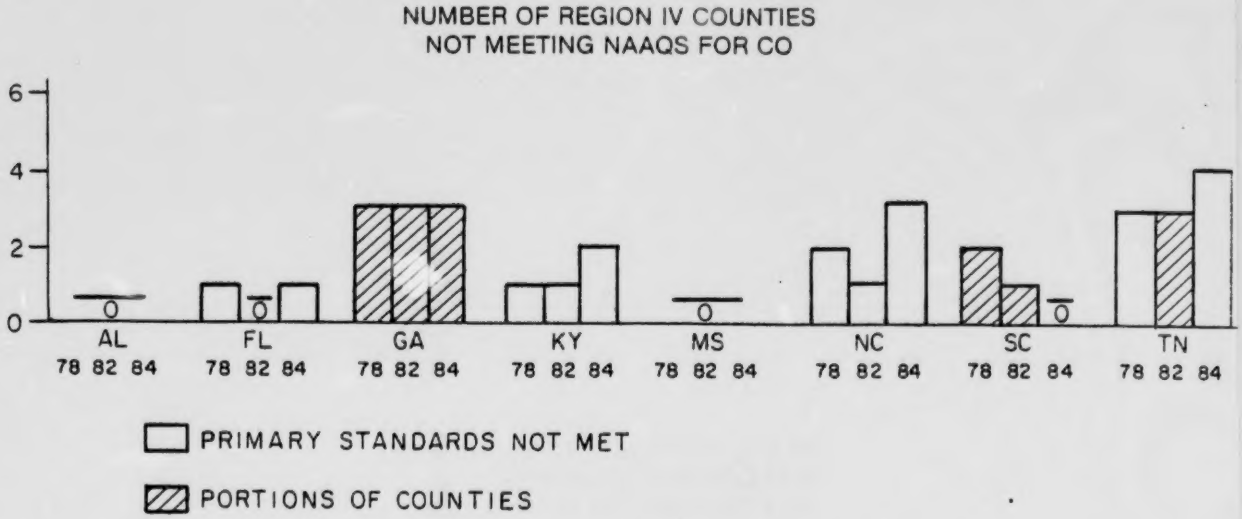


Figure AQ - 3

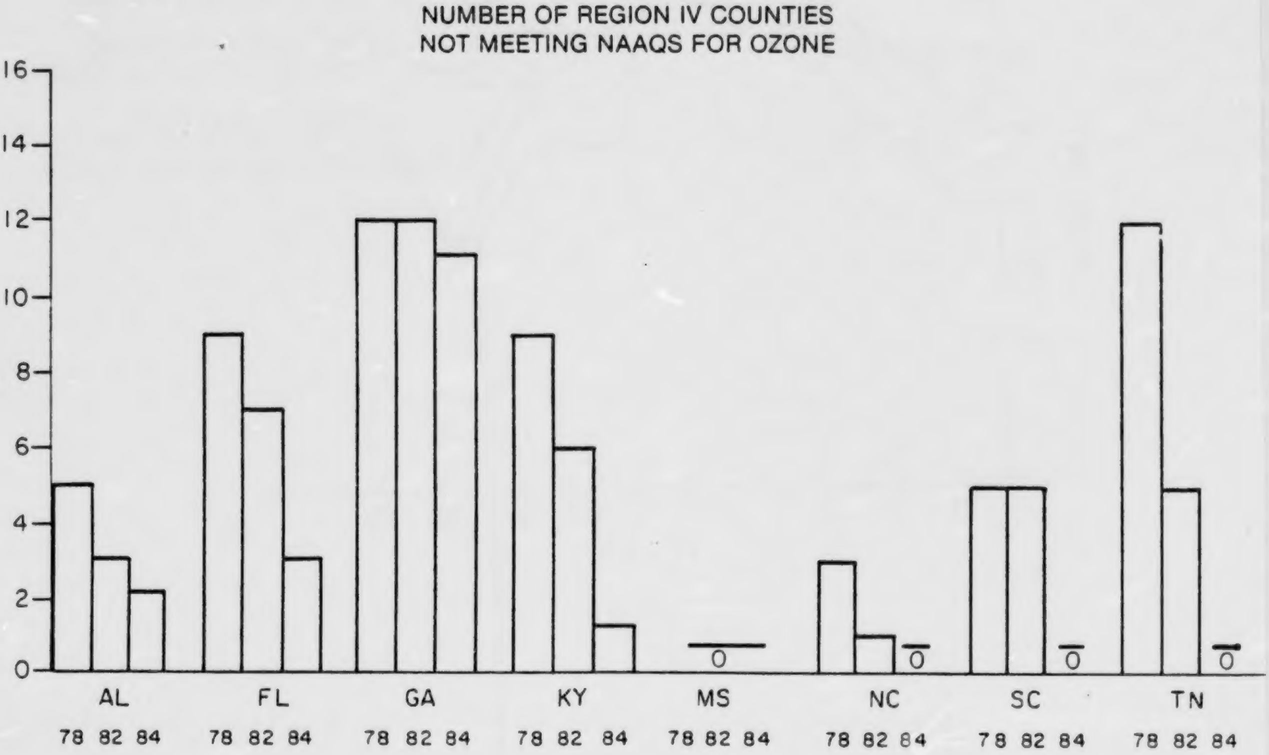


Figure AQ - 4

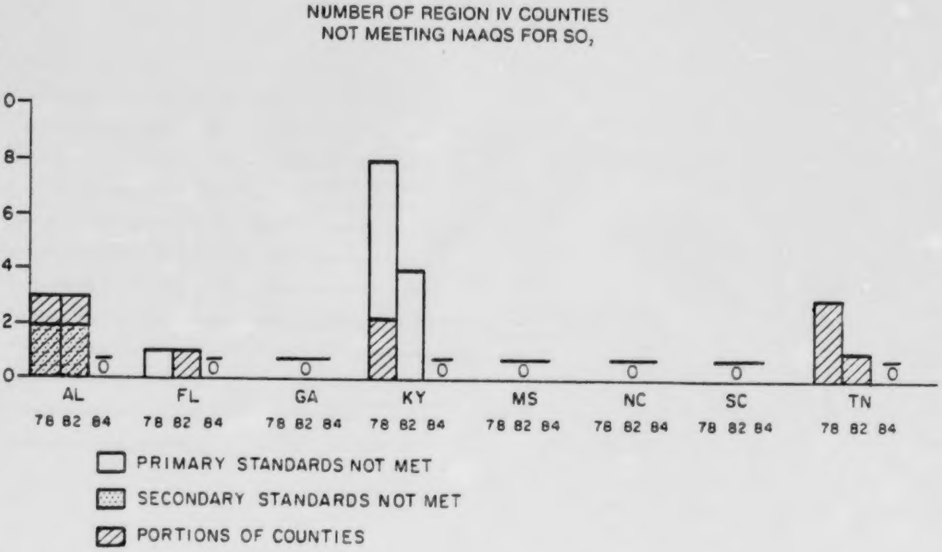


Figure AQ - 5

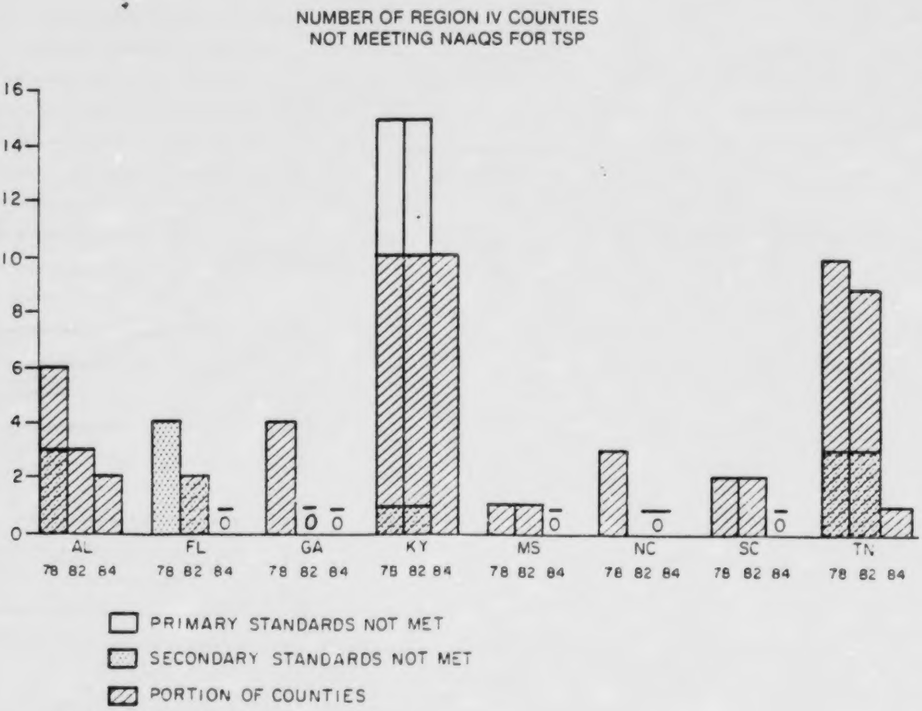
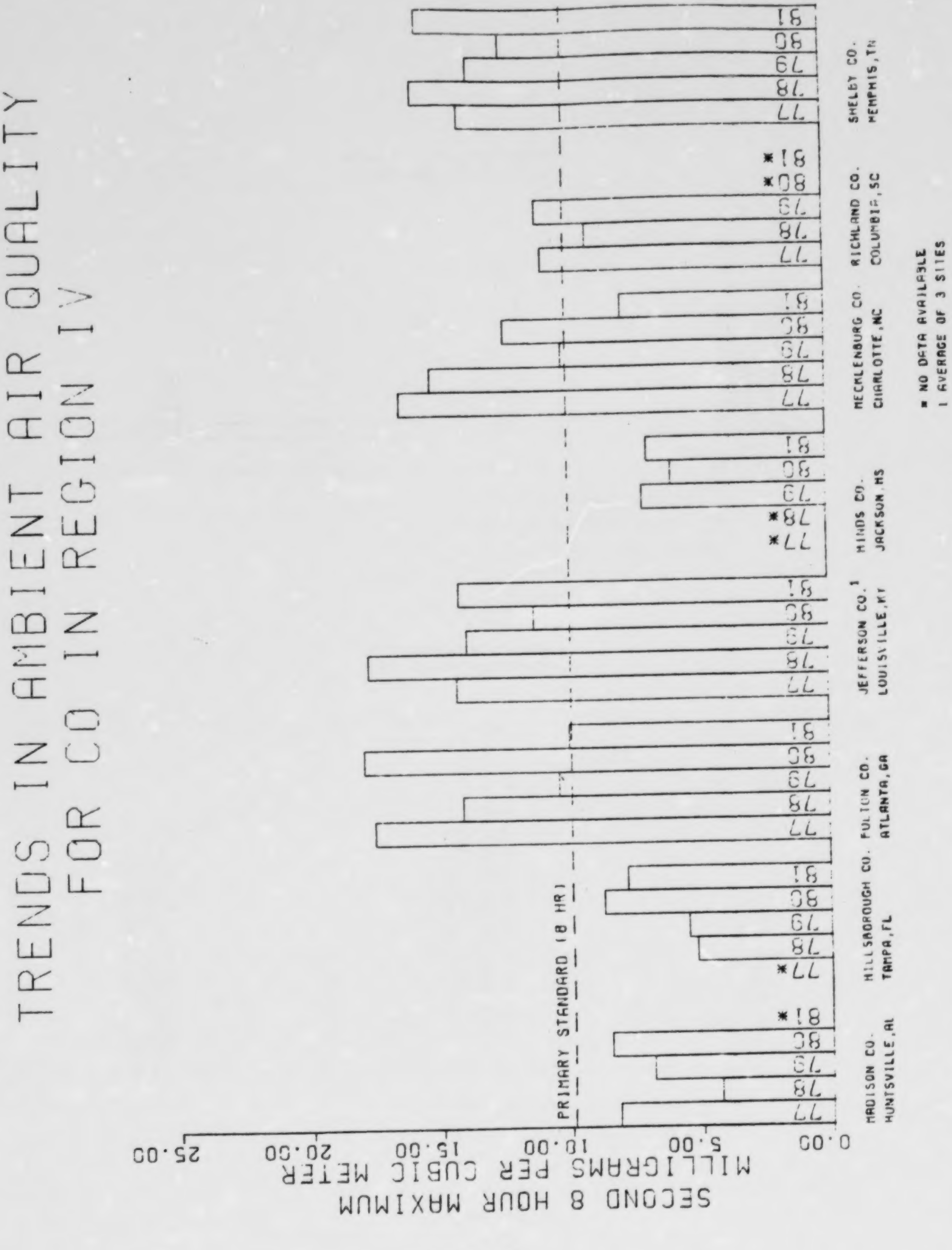


Figure AQ - 6

23


TRENDS IN AMBIENT AIR QUALITY FOR CO IN REGION IV

* NO DATA AVAILABLE
1 AVERAGE OF 3 SITES

Figure AQ-7

TRENDS IN AMBIENT AIR QUALITY FOR OZONE IN REGION IV

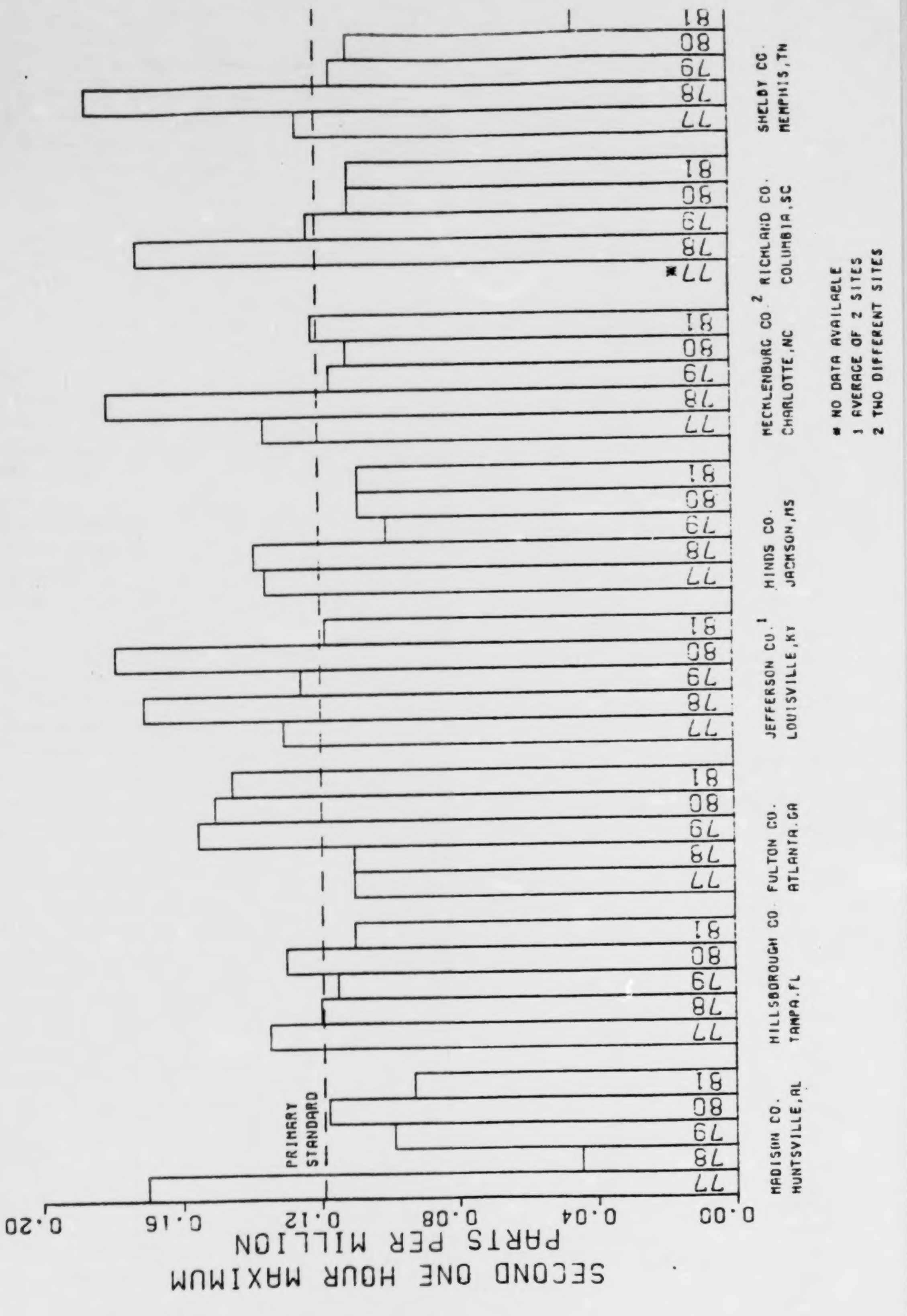


Figure AQ-8

Reproduced from best available copy.

TRENDS IN AMBIENT AIR QUALITY FOR SO2 IN REGION IV

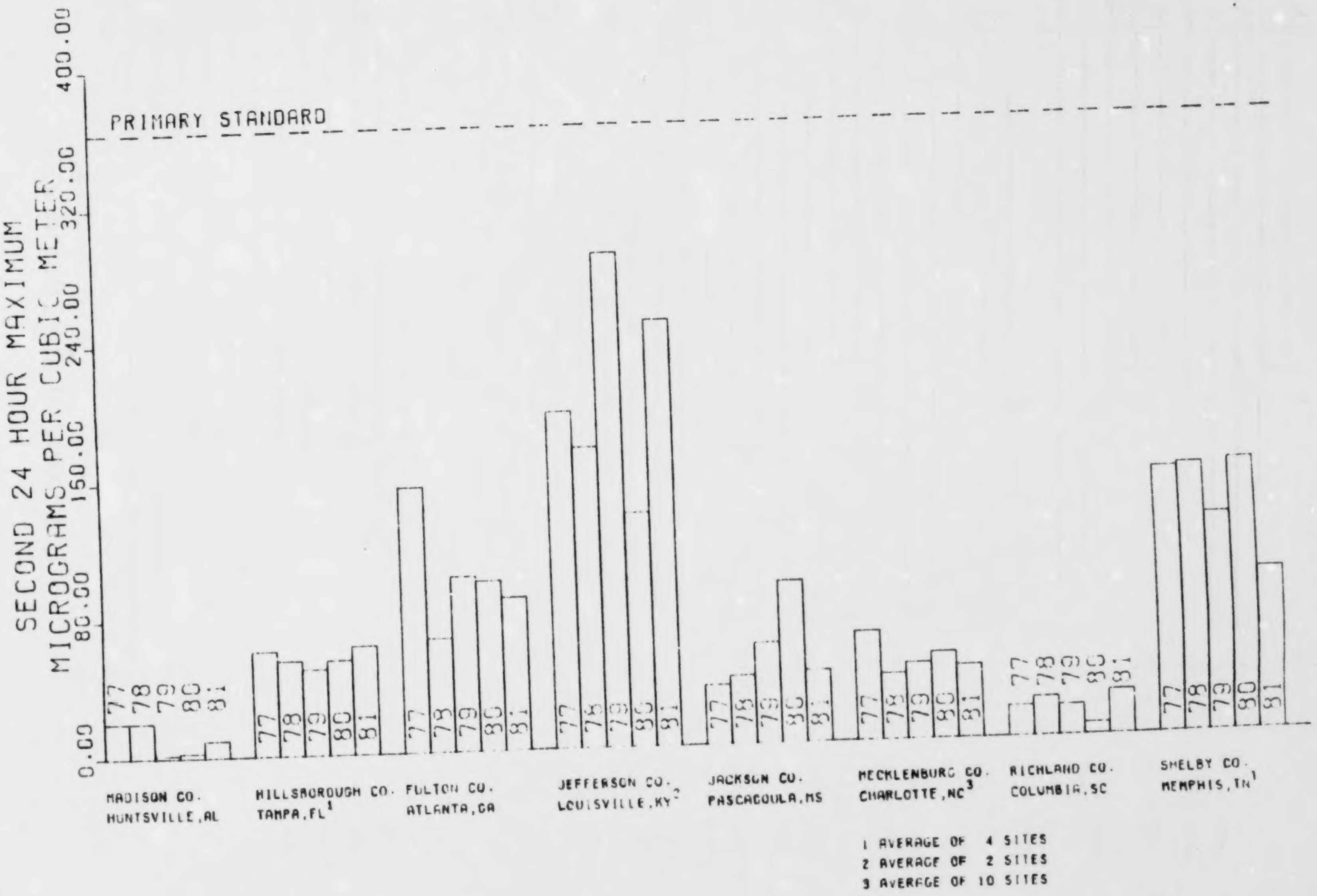


Figure AQ-9

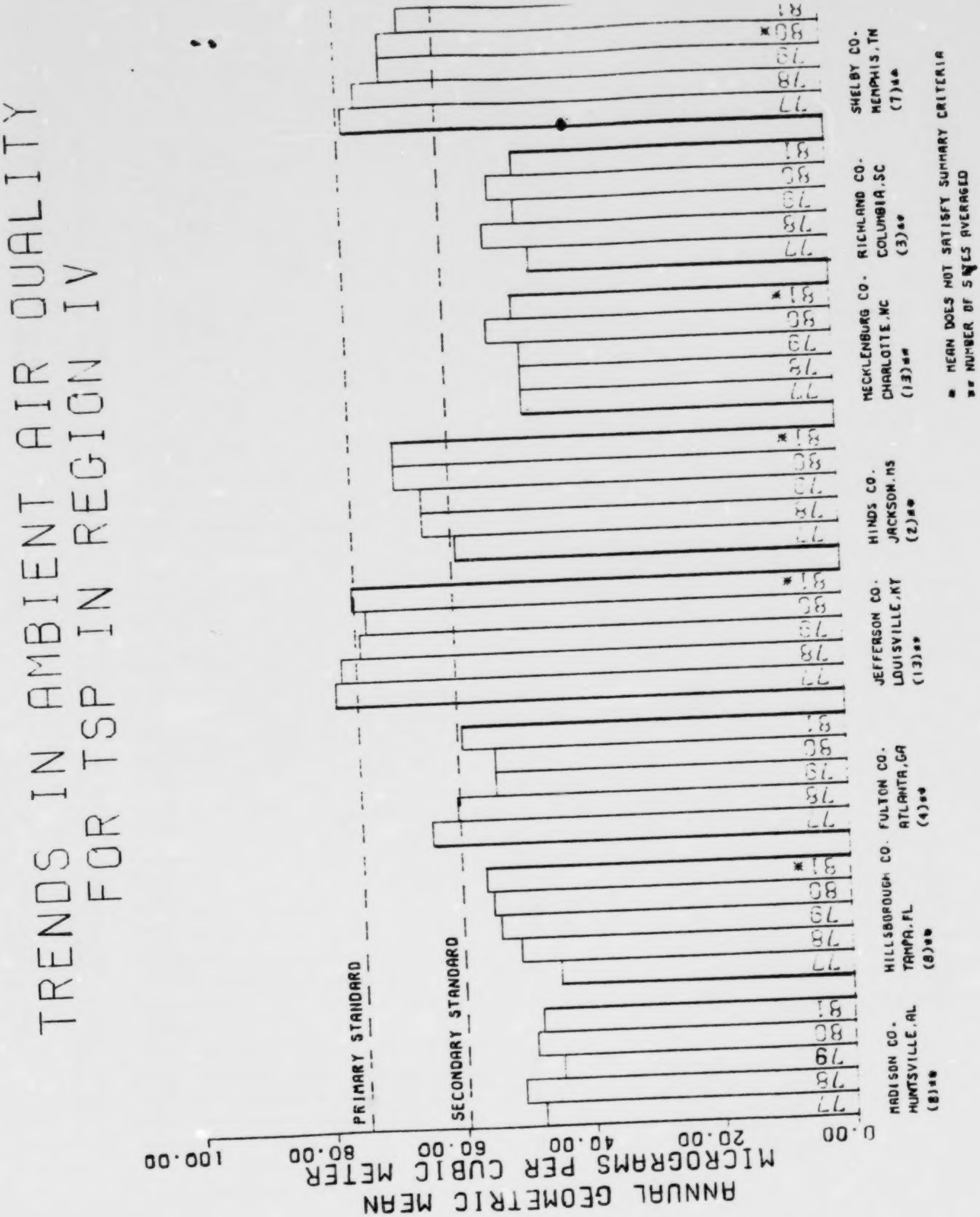

TRENDS IN AMBIENT AIR QUALITY
FOR TSP IN REGION IV
PRIMARY STANDARD
SECONDARY STANDARD
ANNUAL GEOMETRIC MEAN
MICROGRAMS PER CUBIC METER
0.00
20.00
40.00
60.00
80.00
100.00
77
78
79
80
81
81*
80*
MADISON CO.
HUNTSVILLE,AL
(8)**
HILLSBOROUGH CO.
TAMPA,FL
(8)**
FULTON CO.
ATLANTA,GA
(4)**
JEFFERSON CO.
LOUISVILLE,KY
(13)**
HINDS CO.
JACKSON,MS
(2)**
MECKLENBURG CO.
CHARLOTTE,NC
(13)**
RICHLAND CO.
COLUMBIA,SC
(3)**
SHELBY CO.
MEMPHIS,TN
(7)**
* MEAN DOES NOT SATISFY SUMMARY CRITERIA
** NUMBER OF SITES AVERAGED

Figure AQ-10

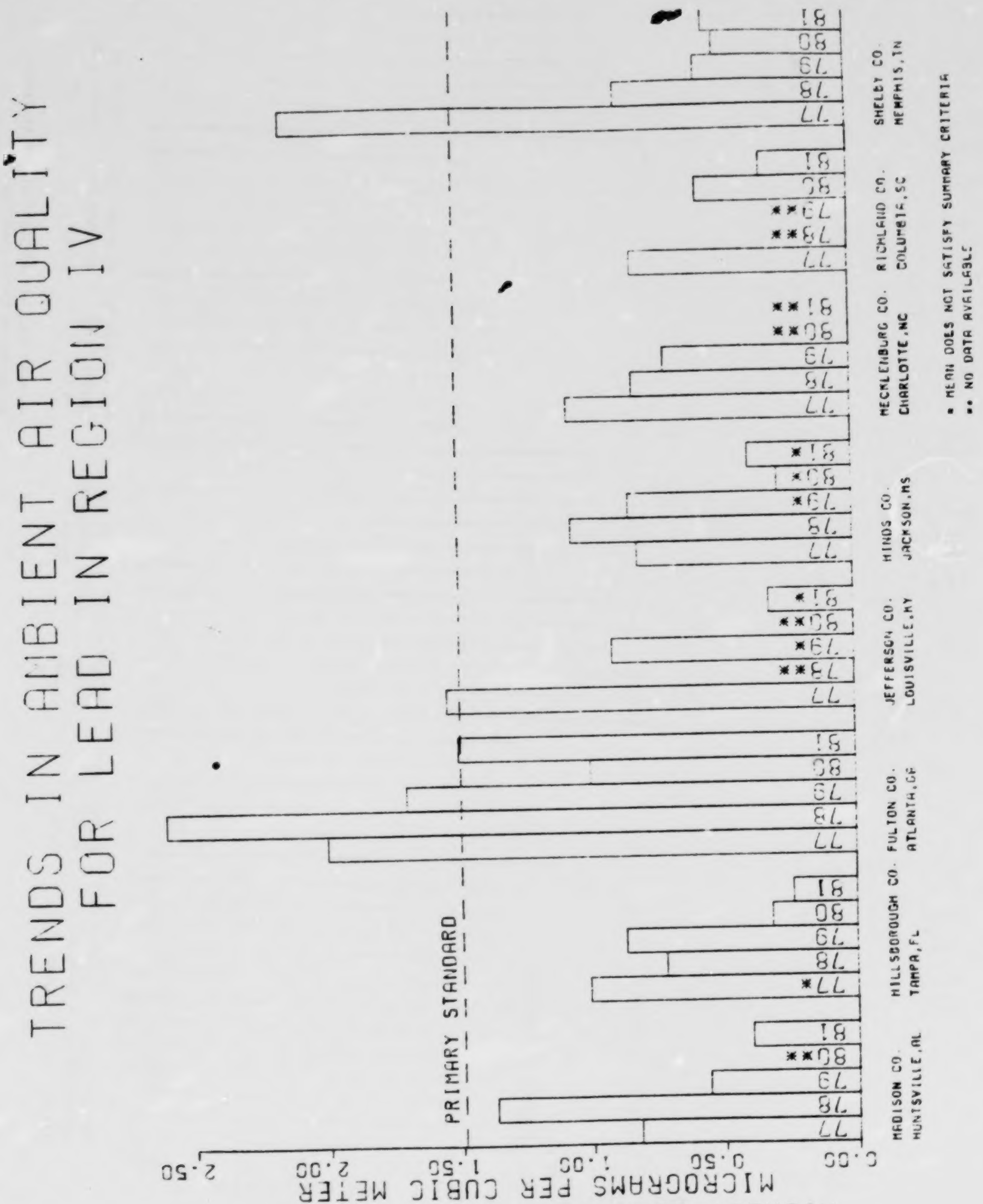
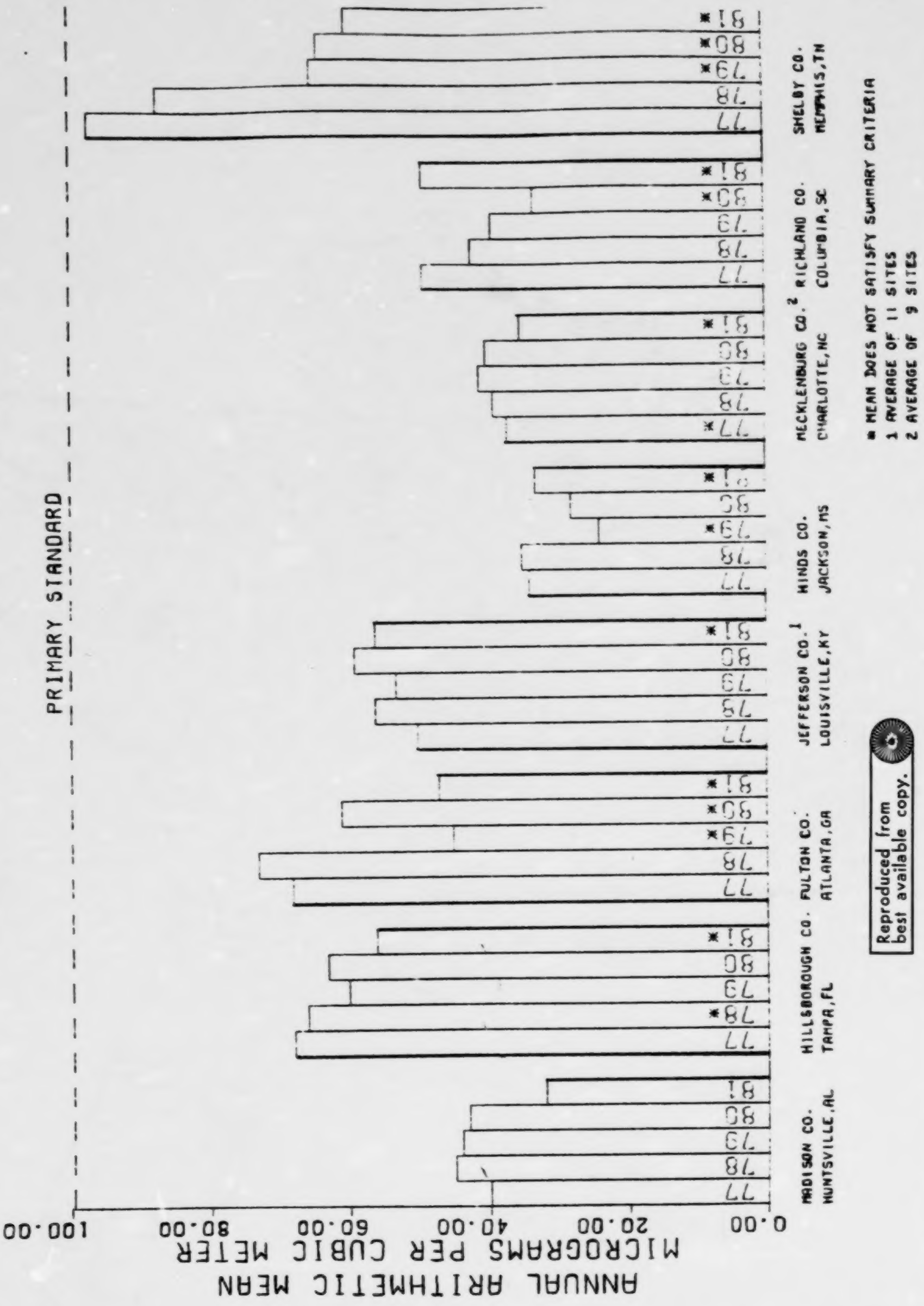

TRENDS IN AMBIENT AIR QUALITY
FOR LEAD IN REGION IV
PRIMARY STANDARD
HIGHEST QUARTERLY ARITHMETIC MEAN
MICROGRAMS PER CUBIC METER
0.00
0.50
1.00
1.50
2.00
2.50
77
78
79
80**
81
77*
78
79
80
81
77
78
79
80
81
77
78**
79*
80**
81*
77
78
79*
80*
81*
77
78
79
80**
81**
77
78**
79**
80
81
77
78
79
80
81
MADISON CO.
HUNTSVILLE, AL
HILLSBOROUGH CO.
TAMPA, FL
FULTON CO.
ATLANTA, GA
JEFFERSON CO.
LOUISVILLE, KY
HINDS CO.
JACKSON, MS
MECKLENBURG CO.
CHARLOTTE, NC
RICHLAND CO.
COLUMBIA, SC
SHELBY CO.
MEMPHIS, TN
* MEAN DOES NOT SATISFY SUMMARY CRITERIA
** NO DATA AVAILABLE

Figure AQ-11

TRENDS IN AMBIENT AIR QUALITY FOR NO2 IN REGION IV



Reproduced from best available copy.

Figure AQ-12

AMBIENT AIR QUALITY STATUS
REGION IV CO 1981

Reproduced from best available copy.

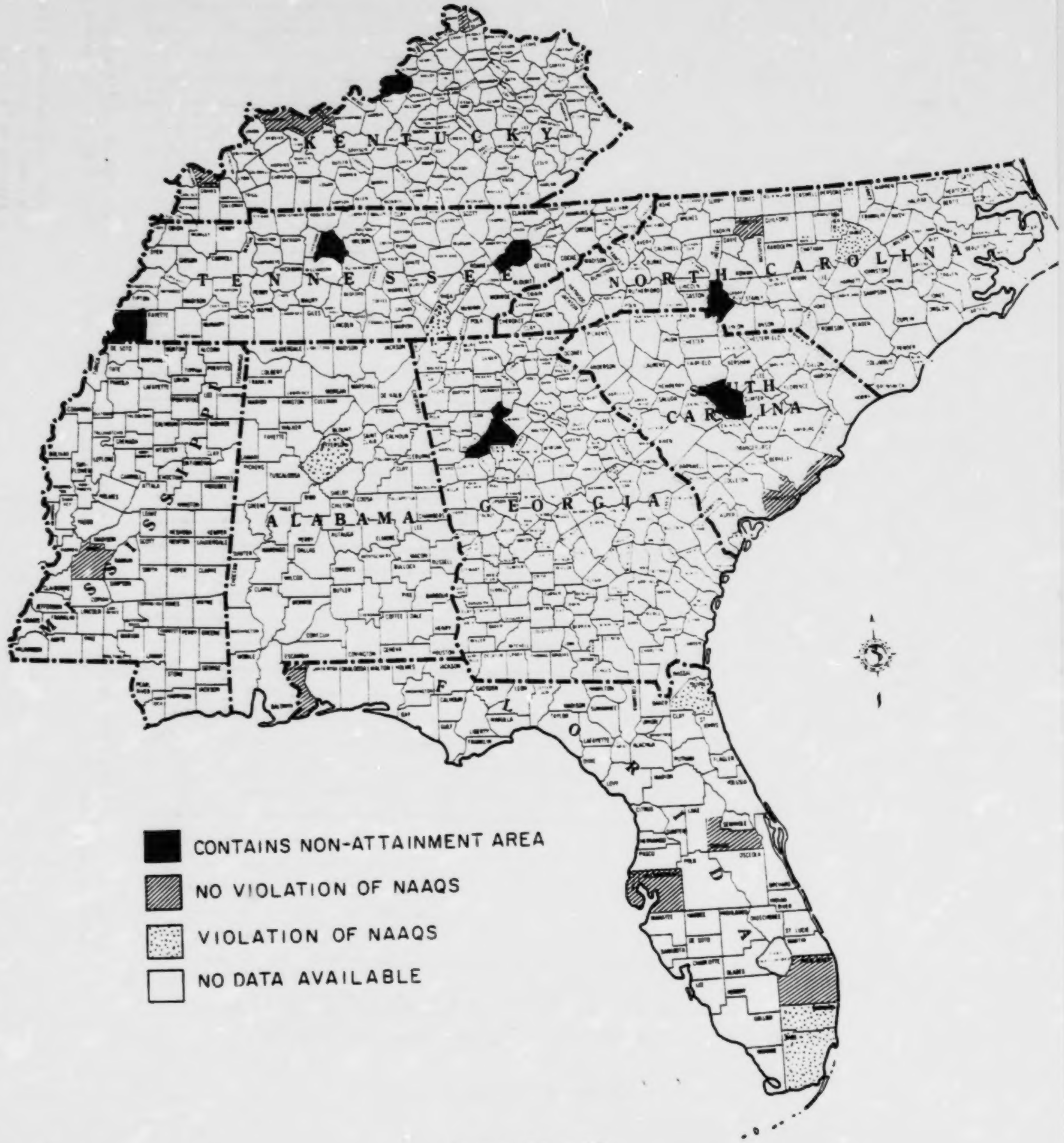

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
■ CONTAINS NON-ATTAINMENT AREA
▨ NO VIOLATION OF NAAQS
░ VIOLATION OF NAAQS
☐ NO DATA AVAILABLE

Figure AQ - 13

AMBIENT AIR QUALITY STATUS
REGION IV OZONE 1981

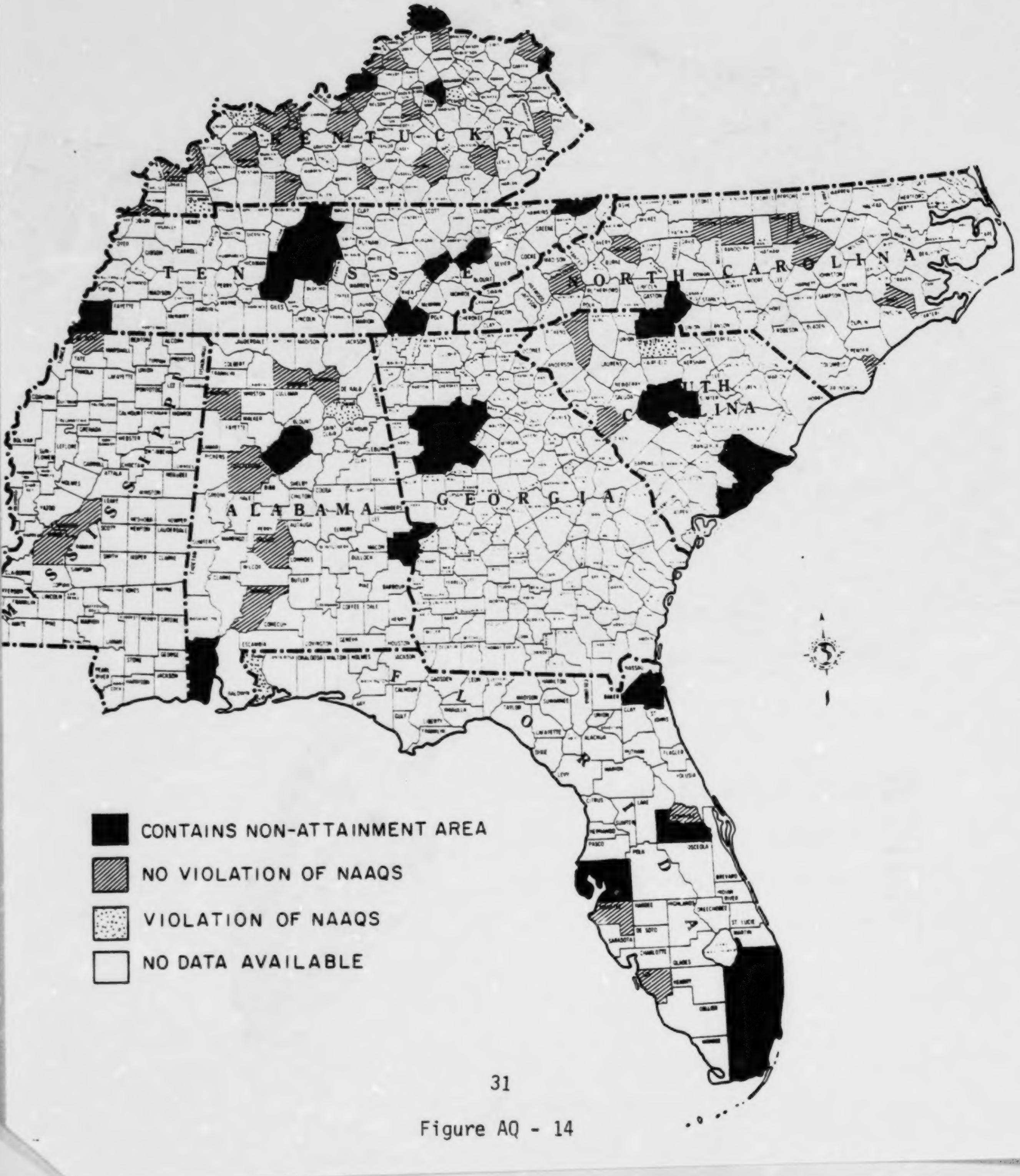

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
■ CONTAINS NON-ATTAINMENT AREA
▨ NO VIOLATION OF NAAQS
░ VIOLATION OF NAAQS
☐ NO DATA AVAILABLE

Figure AQ - 14

AMBIENT AIR QUALITY STATUS
REGION IV SO_2, 1981

Reproduced from
best available copy.

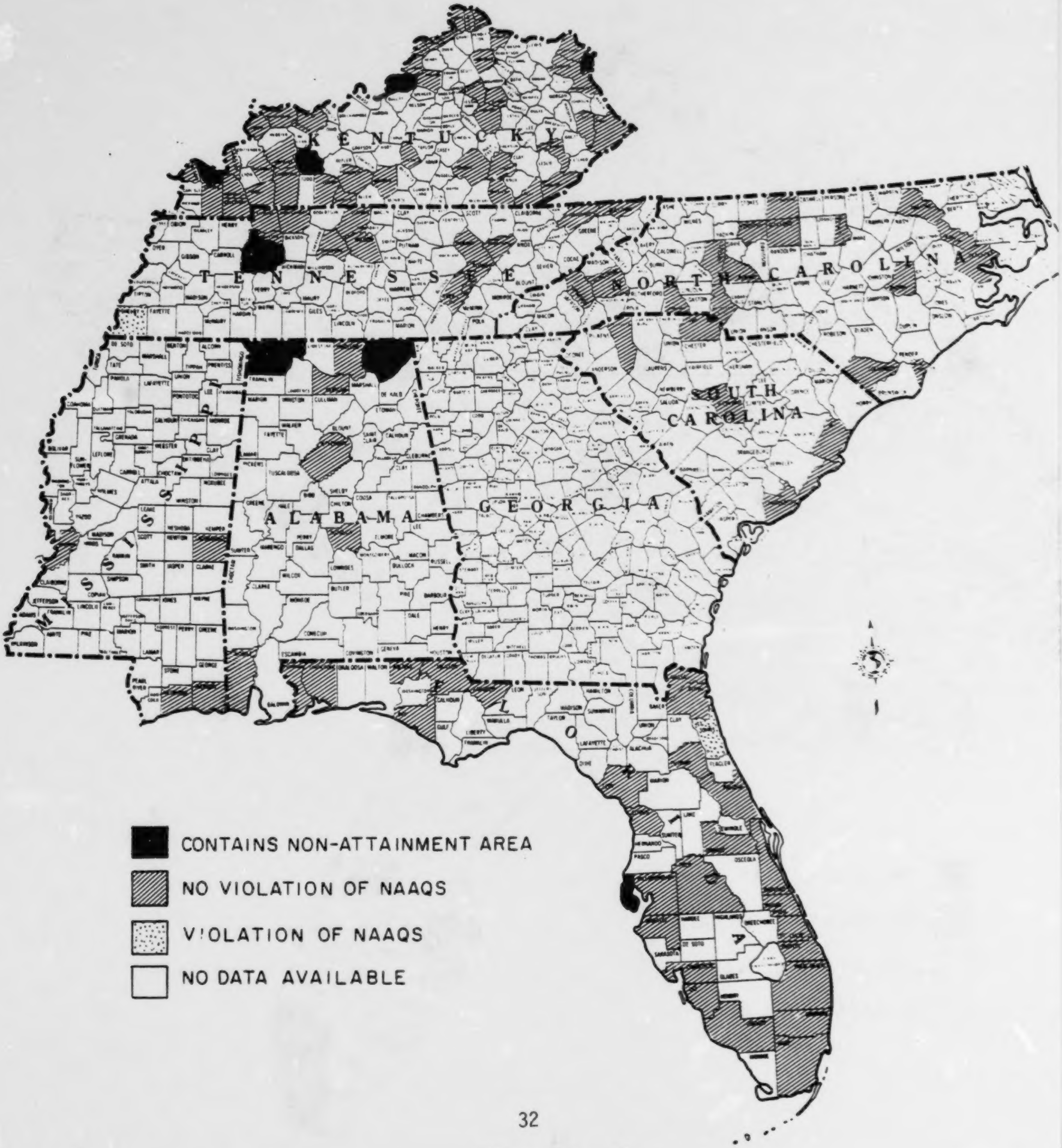

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
■ CONTAINS NON-ATTAINMENT AREA
▨ NO VIOLATION OF NAAQS
░ VIOLATION OF NAAQS
☐ NO DATA AVAILABLE

Figure AQ - 15

AMBIENT AIR QUALITY STATUS
REGIONAL IV TSP 1981

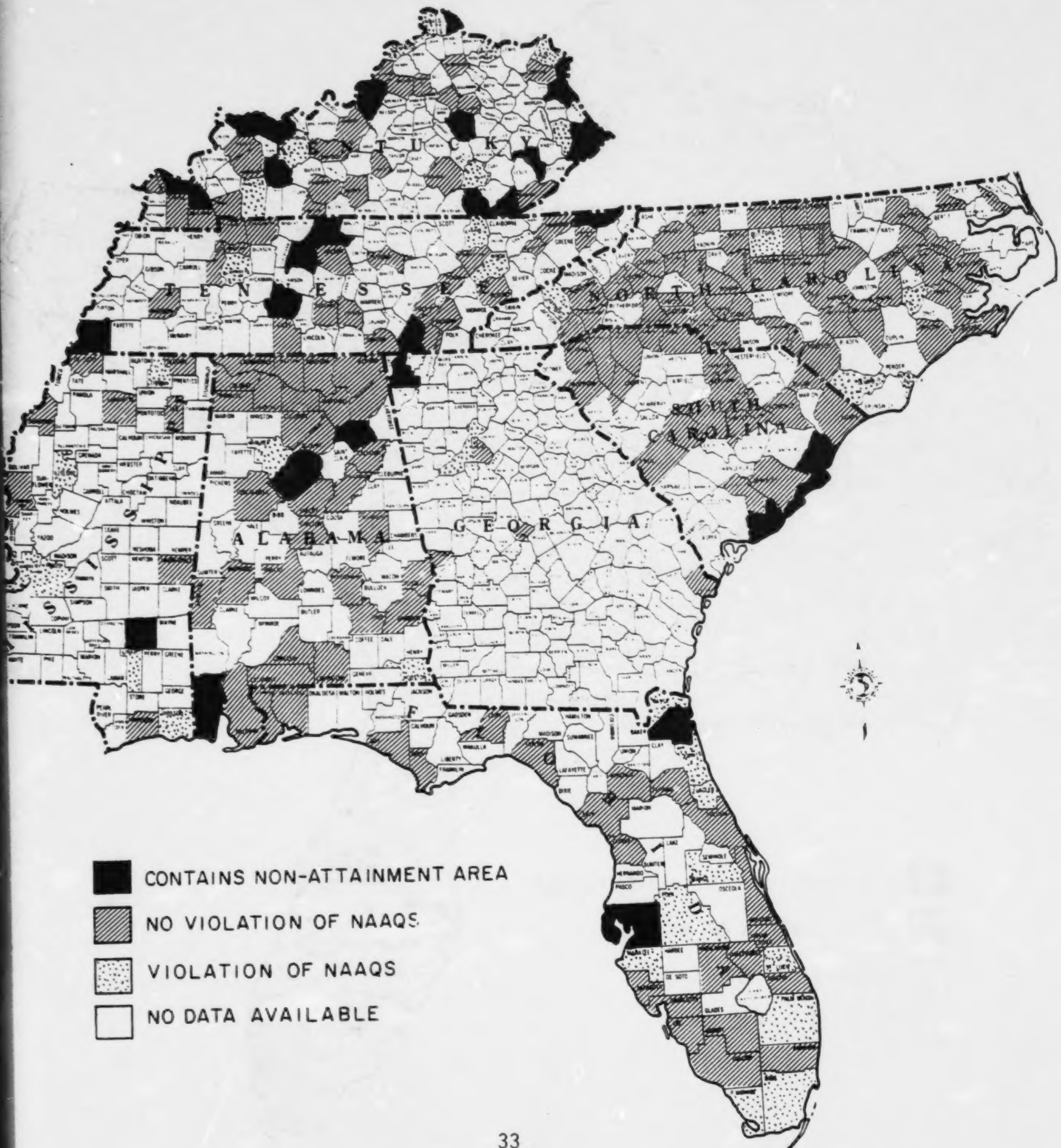

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
■ CONTAINS NON-ATTAINMENT AREA
▨ NO VIOLATION OF NAAQS
░ VIOLATION OF NAAQS
☐ NO DATA AVAILABLE

Figure AQ - 16

AMBIENT AIR QUALITY STATUS
REGION IV LEAD 1981

Reproduced from best available copy.

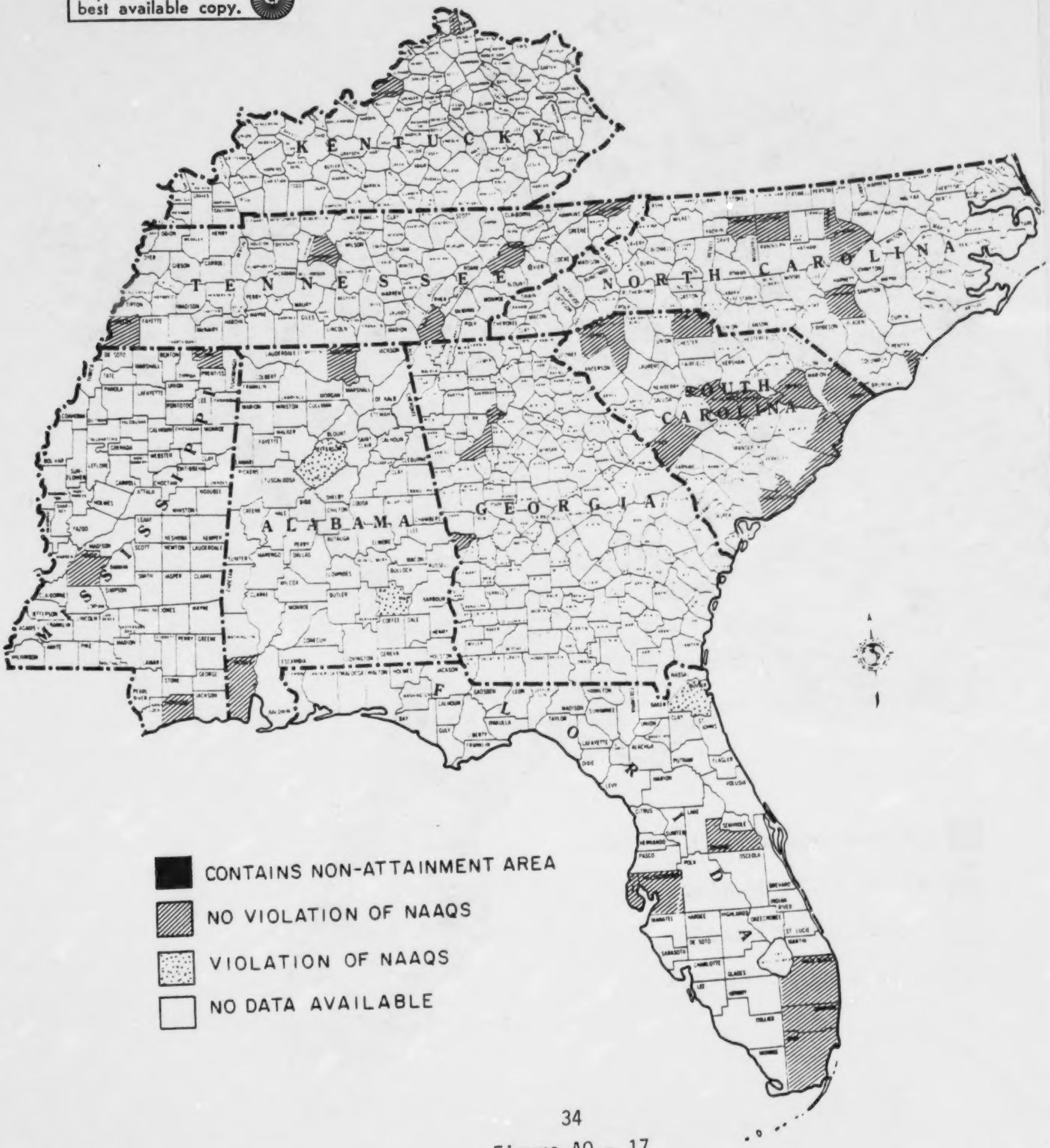

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
CONTAINS NON-ATTAINMENT AREA
NO VIOLATION OF NAAQS
VIOLATION OF NAAQS
NO DATA AVAILABLE

Figure AQ - 17

AMBIENT AIR QUALITY STATUS
REGION IV NO_2 1981

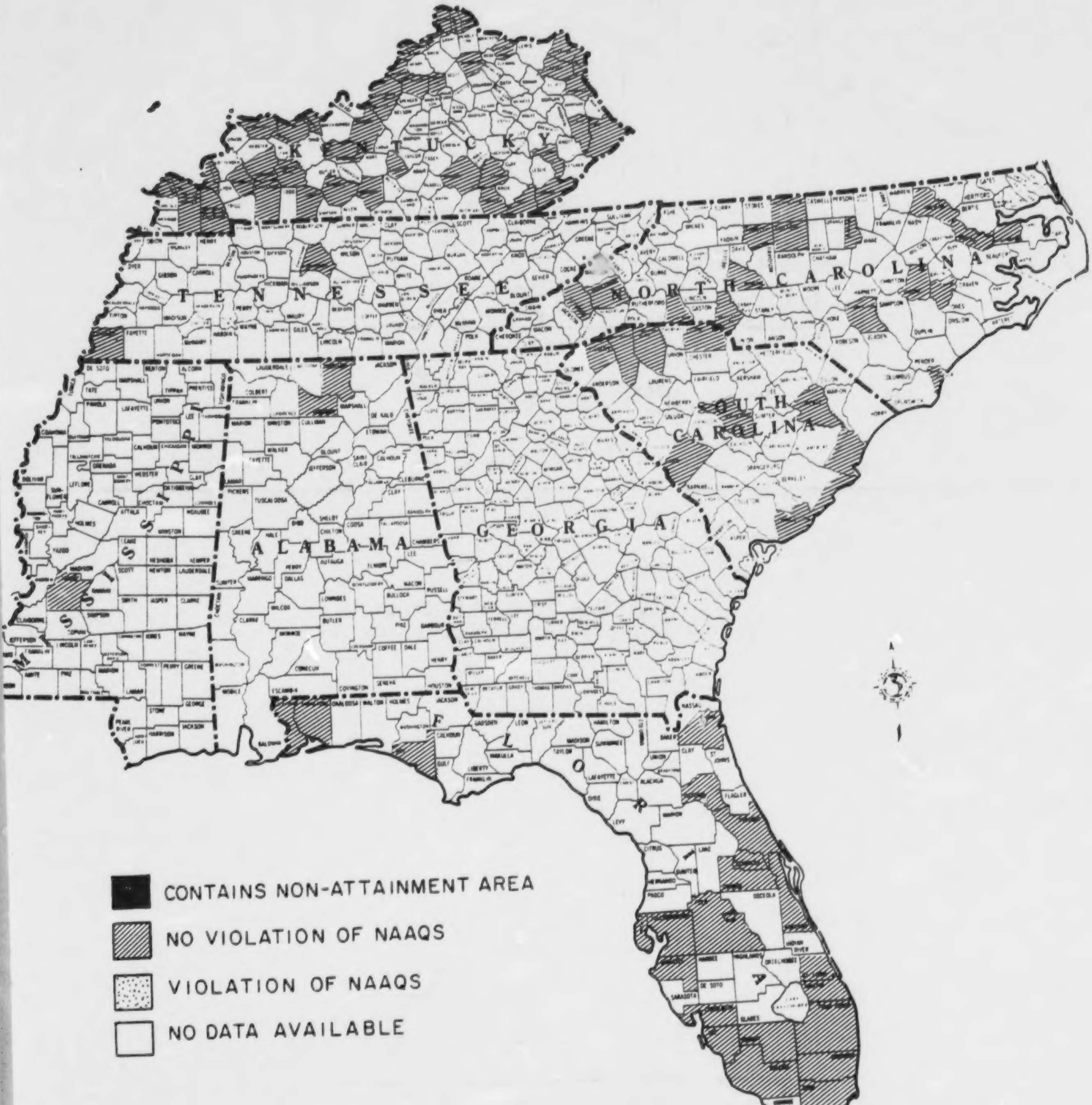

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
■ CONTAINS NON-ATTAINMENT AREA
▨ NO VIOLATION OF NAAQS
░ VIOLATION OF NAAQS
☐ NO DATA AVAILABLE

Figure AQ - 18

PERCENTAGE OF SQUARE MILES IN
NON-ATTAINMENT COUNTIES IN REGION IV

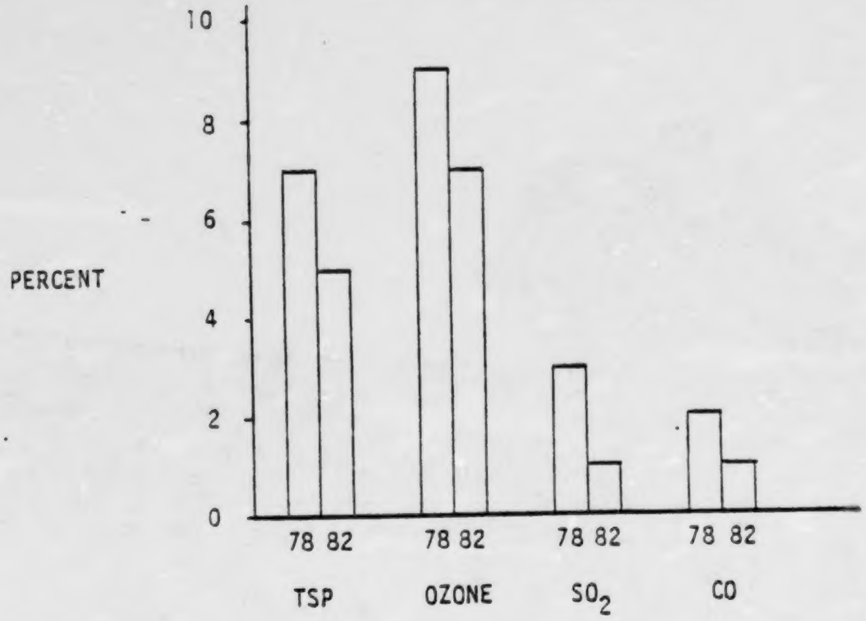


Figure AQ - 19

PERCENTAGE OF POPULATION IN
NON-ATTAINMENT COUNTIES IN REGION IV

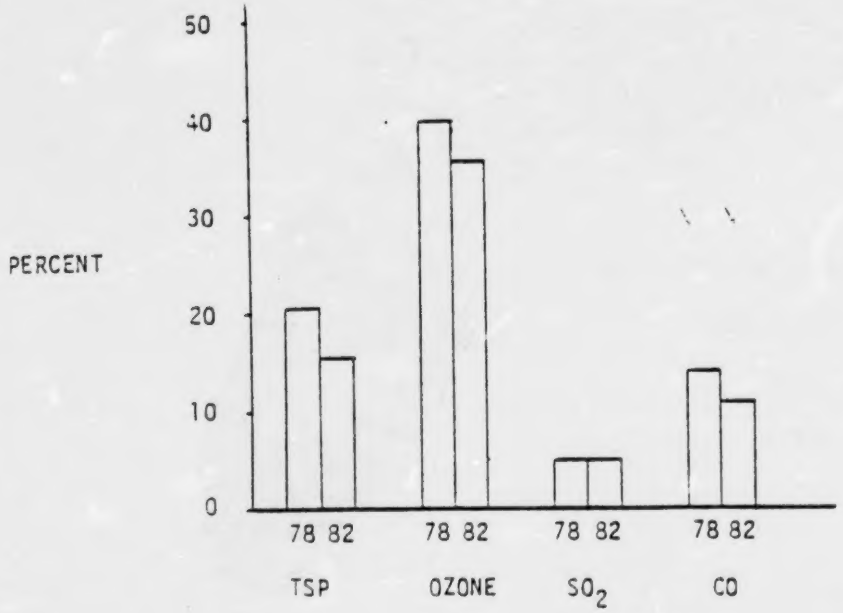


Figure AQ - 20

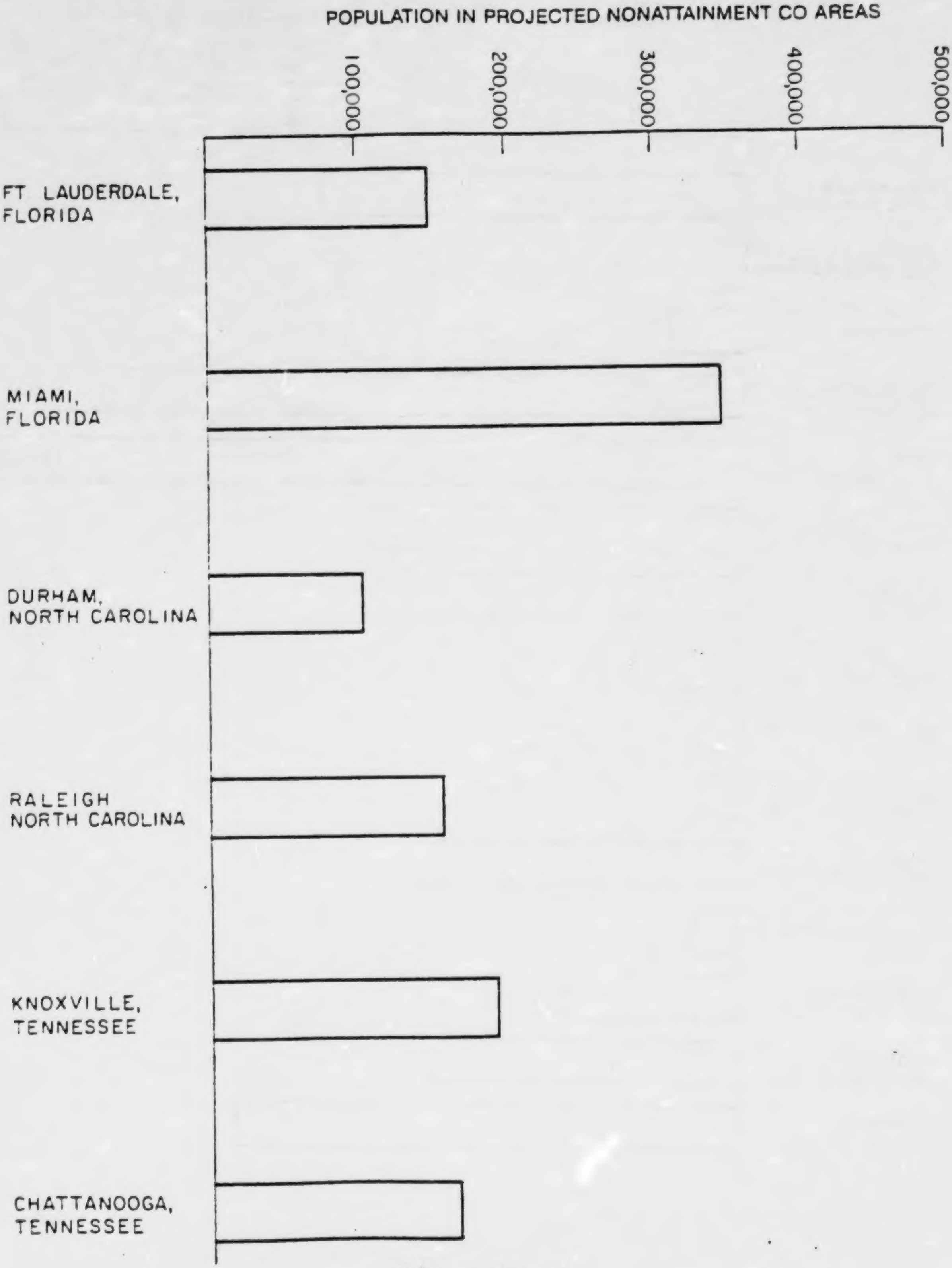

POPULATION IN PROJECTED NONATTAINMENT CO AREAS
100,000
200,000
300,000
400,000
500,000
FT LAUDERDALE, FLORIDA
MIAMI, FLORIDA
DURHAM, NORTH CAROLINA
RALEIGH NORTH CAROLINA
KNOXVILLE, TENNESSEE
CHATTANOOGA, TENNESSEE

Figure AQ-21

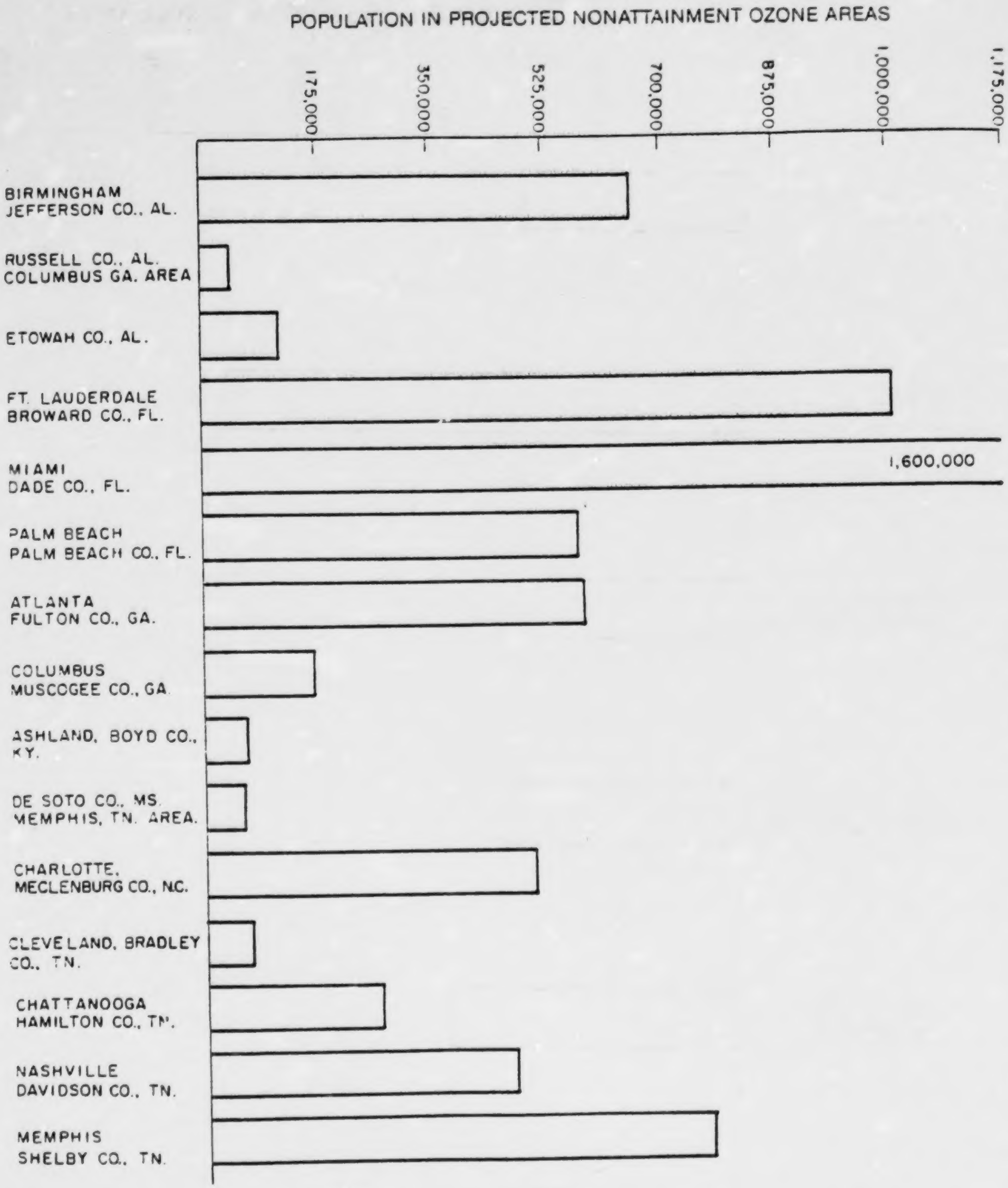

POPULATION IN PROJECTED NONATTAINMENT OZONE AREAS
175,000
350,000
525,000
700,000
875,000
1,000,000
1,175,000
BIRMINGHAM JEFFERSON CO., AL.
RUSSELL CO., AL. COLUMBUS GA. AREA
ETOWAH CO., AL.
FT. LAUDERDALE BROWARD CO., FL.
MIAMI DADE CO., FL.
1,600,000
PALM BEACH PALM BEACH CO., FL.
ATLANTA FULTON CO., GA.
COLUMBUS MUSCOGEE CO., GA.
ASHLAND, BOYD CO., KY.
DE SOTO CO., MS. MEMPHIS, TN. AREA.
CHARLOTTE, MECLENBURG CO., NC.
CLEVELAND, BRADLEY CO., TN.
CHATTANOOGA HAMILTON CO., TN.
NASHVILLE DAVIDSON CO., TN.
MEMPHIS SHELBY CO., TN.

Figure AQ-22

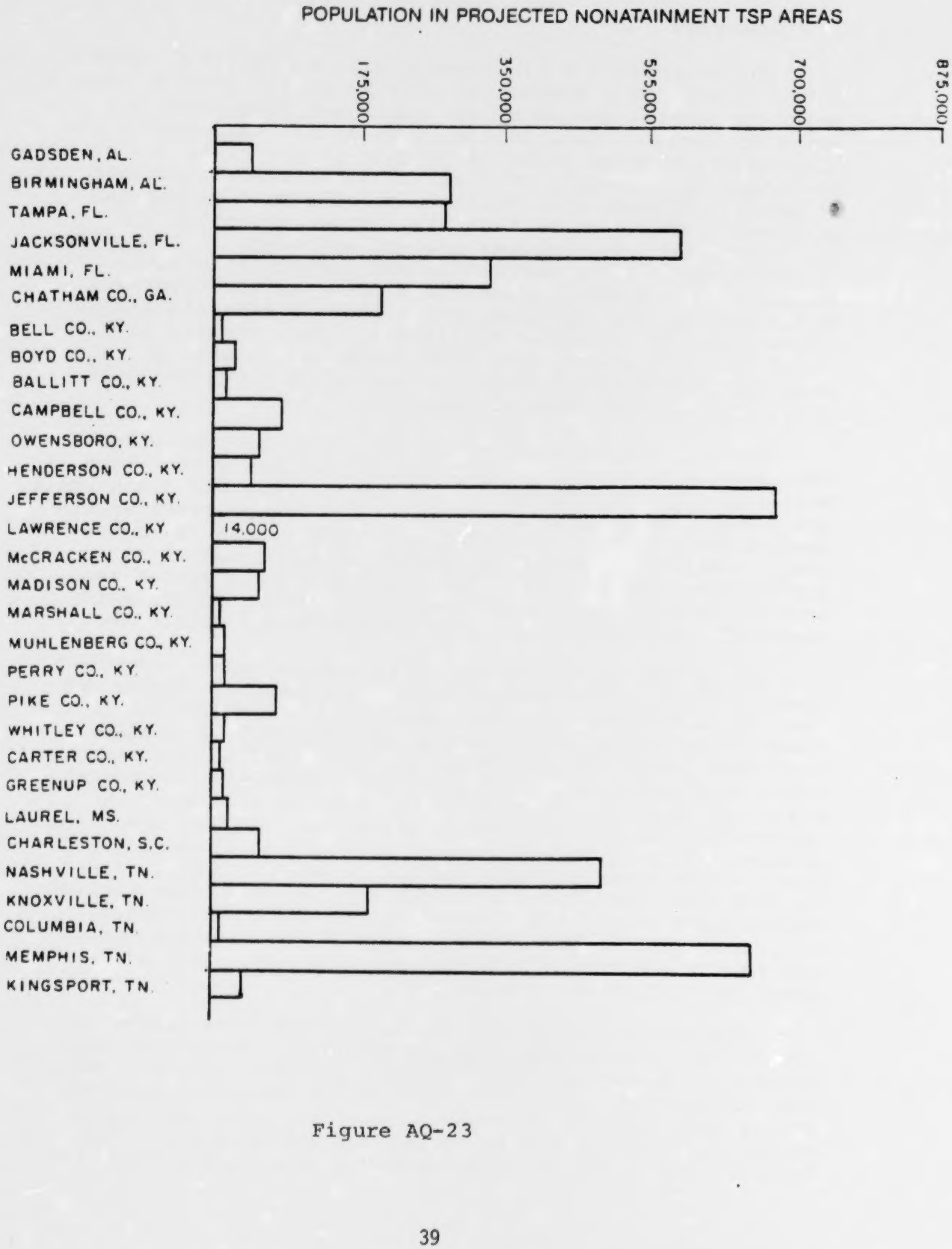

POPULATION IN PROJECTED NONATAINMENT TSP AREAS
175,000
350,000
525,000
700,000
875,000
GADSDEN, AL.
BIRMINGHAM, AL.
TAMPA, FL.
JACKSONVILLE, FL.
MIAMI, FL.
CHATHAM CO., GA.
BELL CO., KY.
BOYD CO., KY.
BALLITT CO., KY.
CAMPBELL CO., KY.
OWENSBORO, KY.
HENDERSON CO., KY.
JEFFERSON CO., KY.
LAWRENCE CO., KY
14,000
McCRACKEN CO., KY.
MADISON CO., KY.
MARSHALL CO., KY.
MUHLENBERG CO., KY.
PERRY CO., KY.
PIKE CO., KY.
WHITLEY CO., KY.
CARTER CO., KY.
GREENUP CO., KY.
LAUREL, MS.
CHARLESTON, S.C.
NASHVILLE, TN.
KNOXVILLE, TN.
COLUMBIA, TN.
MEMPHIS, TN.
KINGSPORT, TN.

Figure AQ-23

WATER QUALITY

1. Overview

Southeastern U.S. is blessed with a plentiful surface water supply. The Region has over 90 rivers greater than 50 miles in length, and over 1000 lakes and impoundments 5 acres or larger. Yet, according to a 1978 EPA report, the water quality of at least 74 percent of the river basins in the South is adversely affected by industrial discharges and 91 percent by municipal discharges. The most widespread problems continue to be bacteria, oxygen depletion and nutrients, but the problems are not as severe as they were 10 years ago. Rapid population and industrial growth, especially in coastal areas, have often outstripped the abilities of local governments to provide adequate sewage collection and treatment facilities. As a result, high fecal coliform counts have been found in a number of swimming and shellfishing areas, particularly along the Gulf Coast and Carolina coastal waters.

Through the NPDES program, pollution control efforts have generally been more successful with industrial than with municipal dischargers. The major municipal dischargers are largely meeting permit limits, but needed improvements include pretreatment of industrial wastewaters to remove toxic chemicals. Recent attention to minor municipal dischargers (under 1 mgd) has exposed serious violations attributed to a variety of reasons including substandard outdated construction and poor operation and maintenance.

Since the early 1970's, large sums of money have been spent for pollution control within the Region. Since 1973, over $4.36 billion have been spent under Section 201 of the Clean Water Act on construction of municipal wastewater treatment plants in the Region. When PL92-500 was enacted, there were approximately 100 primary wastewater treatment plants in Region IV. Sixty-nine of those are still in operation, but 35 have Step 3 grants and 21 have Step 1 or 2 grants. Only 13 plants have no grants. An inventory of grant funds spent is shown in Figure WQ-1. Even greater amounts have been spent by industry. Other monies include Federal and state funds for the state pollution control programs, Section 208 grants (largely for nonpoint source controls), and other supplementary EPA funds such as those under Section 205(g) and 205(j).

Implementation of Section 201 of the Clean Water Act (PL 92-500) has resulted in the planning, design and construction of sophisticated sewage treatment plants. These complex systems require highly trained and motivated operators, and, because of salary, chemical cost, and energy costs, they are expensive to operate and maintain. The Federal, state and local governments have an enormous investment to protect; yet, the trend is to minimize operation and maintenance expenditures. If this trend is permitted to continue, billions of dollars already spent toward the clean-up of municipal sewage could be wasted.

Manufacturing establishments in Region IV spent an estimated $4.2 billion on water pollution abatement between 1973 and 1980. Of this amount, $1.6 billion was for capital expenditures and $2.6 billion was for operation and maintenance expenses. The leading manufacturing industries in both capital and operational expenditures were chemical and allied products, paper and allied products, and the primary metal industry. Annual expenditures for the Region are shown in the following table.

Annual Manufacturing Pollution Abatement
Expenditures, 1973-1980 ($ million)

	1973	1974	1975	1976	1977	1978	1979	1980
Capital	147.3	181.0	276.6	255.7	205.8	196.8	116.6	171.1
O&M	144.5	187.3	230.5	283.0	379.9	412.4	478.6	485.2
Total	291.8	368.3	507.1	538.7	585.7	609.2	595.2	656.3

Besides these municipal and industrial point sources, southern streams are also subject to nonpoint source pollution from urban runoff, mining (including oil and gas production), agriculture and a variety of other land use operations. No broad base regulatory program currently exists that addresses nonpoint sources. Since the Clean Water Act does not give EPA specific authority to regulate these sources, compliance criteria have not been established except for recommended "best management practices" for various land uses. Control of nonpoint sources is largely accomplished through voluntary programs and programs administered by other agencies.

2. Water Quality Standards

Almost all streams and rivers in the Region are classified "fishable" or "swimmable" (which includes all designated uses for fisheries, shellfishing, recreation, and drinking water) in accordance with the goals of the Clean Water Act. Only three states have waters classified otherwise. Alabama has two small streams in the Mobile area classified "navigation," 59 small streams throughout the state classified "agricultural/industrial" and four small streams in the Birmingham area classified "industrial operations." Florida classified 5.7 miles of the Miami River near Miami and all secondary tertiary canals wholly within agricultural areas for "agricultural supply." In Georgia, river miles 5-22 of the Savannah Riverare classified "navigation/ industrial," the North River is "industrial" and, although streams in urban areas are classified "fishing," intermittent violations are expected from runoff and combined sewer overflows. Kentucky is currently evaluating streams for appropriate classification of state water bodies. The other states in the Region have all streams classified as "fishable" or "swimmable." Exceptions to the "fishable/swimmable" criteria constitute only a negligable percentage of the 17,000 miles of 135 major streams in the Region. Unfortunately, it is not yet possible with currently available monitoring data to establish precisely what percentage of these waters violate their classification standards. As a rough estimate, water quality data for 1980-81 for 189 Basic Water Monitoring (BWMP) Stations in Region IV classified for "fishable/swimmable" uses show at least one violation of a measured parameter at 166 stations (88%), and severe violations at 68 stations (36%). Severe violations were defined at a station where at least one measured parameter value exceeded its applicable criterion by 85% or more. These percentages, however, present a somewhat negative bias because many of the stations are located in problem areas. "Average water quality", however defined, would be better than this rough estimate.

The "Use Impairment Maps" (Figures WQ-2 to WQ-8) show degree of impairment of established State/Federal Water Quality Standards at the state operated BWMP stations in Region IV. For each station, STORET water quality monitoring data for 1980 and 1981 were compared to state criteria for the station's estabished water use and a "use impairment value" was calculated as follows:

> For each criterion applicable to the use designation for a given station, a comparison was made with the STORET values for the appropriate parameter (e.g., for dissolved oxygen, both parameter codes 299 - probe method, and 300 - Winkler method were used). A ratio of parameter value to the criterion was calculated for each value that exceeded the criterion; otherwise, the ratio was set to zero. (An inverse ratio was used for minimum criteria; and, because of the extremely high values encountered in fecal coliform counts, the ratio of the logs of the data and the criteria was used.) The "severity values" for all parameters at a station were then summed to obtain the total "use impairment value" for the station.

The "fishable/swimmable" map (Figure WQ-2) includes all stations with drinking, fishing, or recreational standards. Each "parameter" map (Figures WQ-3 to WQ-8) shows the calculated "severity values" for the individual parameters. (Where the parameters are grouped, or if multiple standards apply to a given station, only the highest "severity value" was plotted on the "parameter" maps.) The relative impairments were designated as follows.

Legend Designation	USE IMPAIRMENT VALUES Fishable/Swimmable Map	SEVERITY VALUES Parameter Maps
Negligible	0-.99	0
Moderate	1-9.9	0.01-0.99
Severe	10 & UP	1.0 & UP

The advantage of these "use impairment" maps is that they show a measure of water quality as it is uniquely related to the established numerical standards in that location, as opposed to a more uniform analysis with a water quality index (WQI). The main disadvantage is that applicable criteria may be entirely different from one site to another. Moreover, because the "use impairment value" for a station is the sum of the individual parameter "severity values," larger "use impairment values" are more likely to result at a station with many applicable criteria than at a station with very few criteria. On the other hand, if parameters for which criteria have been adopted at a station are not measured, smaller impairment values will be calculated. Florida, Kentucky and North Carolina, for example, all have a long list of criteria for the toxic metals; and, as a result, the "fishable/swimmable" map shows numerous violations in those states. In Alabama, on the other hand, the Alabama Water Improvement Commission (now part of the Department of Envirommental Management) did not analyze for fecal coliform and numerical criteria are relatively few. Consequently, relatively few violations are shown in Alabama.

3. Trends

Based on "use impairment values" for the BWMP stations having data for the indicated years, the following trends were determined. (Water quality was considered to improve if "use impairment values" decreased by more than one unit over the indicated time span, to be the same if the change was less than one and to be worse if the value increased by more than one unit.)

WATER QUALITY TRENDS

Based on "Use Impairment Values" expressed as percentage of stations for which data were available in both time periods.

	70/71 to 75/76	75/76 to 80/81	70/71 to 80/81
Improving	61%	27%	54%
Same	20%	52%	33%
Worse	19%	21%	13%

For comparison, based on a WQI analysis, using over 1000 stations on streams for the period 1972 to 1978, Region IV showed improvement in 62 percent of the streams, no trends in 19 percent, and downward trends in 19 percent.

These trend calculations are only as accurate as the data base and the methodology. Fortunately, the EPA Office of Water has committed to publishing a standard methodology for trend determination, which should greatly improve the uniformity of analysis across the country.

4. Water Quality Problem Areas

Specific areas considered to have significant water quality problems are indicated in Figures WQ-9 to WQ-14. These maps should be used cautiously since the assessments from state to state may be affected by variations in the types of data collected and the criteria used to report significant problems; e.g., some states use different criteria to designate "severe," "moderate," or "slight" problems. For example, the cluster of problem areas in eastern Tennessee results largely from the diligence of Tennessee and TVA in reporting problems. Moreover, some states may not even officially recognize a problem that another state considers a severe problem.

Two interstate rivers, the Ochlockonee between Georgia and Florida and the Pigeon between North Carolina and Tennessee, illustrate this latter problem. According to Georgia's standards, the Ochlockonee has only "slight" problems; but downstream, even though the quality has improved, the problem becomes "moderate" when the river crosses into Florida. The Pigeon likewise leaves North Carolina meeting state standards, but crosses the state line in violation of Tennessee's standards. A major problem thus exists when water quality problems are quantified based on state assessments which use different critieria.

From the maps of water quality problem areas (Figures WQ-9 to WQ-14) and those of calculated "use impairments," east Tennessee is one area that stands out as having multiple problems. This is an area where concentrated industrial and municipal discharges impact relatively small headwaters. Coal mining and oil and gas drilling operations contribute significantly to the problems of eastern Tennessee and Kentucky. Excess nutrients are a major problem in the warmer, flatter parts of the Region such as Florida, coastal North Carolina and the Mississippi Delta. The severity of problems in the Mississippi Delta is caused by extensive, long-term use of pesticides, herbicides, and fertilizers. Concentrations of these chemicals in the Mississippi Delta surface water and sediment are among the highest in the country.

Color is a common problem in areas affected by textile/carpet mills and pulp/paper industries. Yet some states, such as North Carolina, can do nothing since state law prohibits state agencies from writing effluent limitations more strict than those of the federal government. Since EPA has not established a color standard, North Carolina can have only a narrative standard (i.e., "will not impair the waters for the best usage"), which is a source of contention with the state of Tennessee concerning the Pigeon River.

The Water Quality Problem Area maps (Figures WQ-9 to WQ-14) are based on the state 305(b) reports for 1980-81 and a review by regional staff and all eight Region IV states plus ORSANCO.

5. Toxics

a. State by State Review

A review of toxics monitoring data reveals scattered problems throughout Region IV. Major extant problems are from contamination by heavy metals (Hg, Cr, Pb, etc.), PCB's and persistent pesticides such as DDT, endrin, chlordane and toxaphene. A state by state review of very sparse and incomplete data follows:

- ALABAMA

  - Mercury

    The lower Mobile River has had a mercury problem for many years that is now nearly dissipated. Sampling of fish tissues begun in 1970 was terminated this year. Mercury is still leaching in small quantities into the river from existing landfills.

- PCB

A PCB problem exists in Weiss Reservoir (Georgia-Alabama) resulting from input from industry in Georgia. The input has been eliminated, but residual PCB's are still present in Weiss Reservoir, and sampling of fish tissues continues.

Choccolocco Creek near Anniston has an ongoing PCB problem. Fish tissues have been collected and sent to Auburn University for analyses. The state is still waiting for results of the analyses.

There is a small operation in Greenville County that is still a problem. Anticipated monitoring of fish tissues will probably begin this year.

- Pesticides

DDT production on Redstone Arsenal in Huntsville, Alabama, during World War II caused widespread dispersal of DDT and its derivatives into the Tennessee River. The plant has been closed, but residual DDT is present in large amounts in Spring Branch and Indian Creek. After being sued, the Company responsible for the contamination agreed January 10, 1983, to provide clean up and citizen compensation. They have presented a 10-year study and monitoring program.

- National Pesticide Monitoring Program

The USFWS has had a national fish tissue pesticide monitoring program in operation since 1969. Fish tissues are analyzed for numerous pesticides, but data for most of them are very sparse. The overall data were reviewed, but because of the paucity of data for most parameters, only four pesticides were selected for representation. They are endrin, dieldren, toxaphene and total DDT. The data were analyzed for levels of concentration and trends over time. Whole fish samples are utilized in this program as opposed to fillets used by FDA to determine action levels. At present, there is no calculated correlation between whole fish values and fillets, but the following comments utilize the FDA action level as an indicator of possible concern. The analyses were performed on all species collected during a sampling period.

Alabama has two stations represented in the national network: Tombigbee River near McIntosh and Alabama River near Chrysler.

- Concentration

  No concentrations reached FDA action levels.

- Trends

  Significant denotes a trend at the 95% confidence limit. Nonsignificant denotes a visual trend that is not statistically significant at the 95% level.

Total DDT:	Alabama River -- significant (95%) decrease Tombigbee River -- no trend
Endrin:	Alabama River -- significant increase Tombigbee River -- significant increase
Dieldrin:	Alabama River -- nonsignificant decrease Tombigbee River -- significant decrease
Toxaphene:	Alabama River -- significant increase Tombigbee River -- nonsignificant increase

- FLORIDA

  o Mercury

  Mercury has been detected in shellfish tissue in the southwest portion of the state. This discovery is being followed up with sediment sampling and analysis.

  o PCB

  Sediment samples from the St. John's River suggested a possible problem in the Jacksonville area. Concentrations of PCBs in fish tissues were very low. There is no follow-up study anticipated at this time.

- National Pesticides Monitoring Program

  Florida has one station represented in the network. It is located on the St. Lucie canal near Indiantown.

  - Concentration

    None above FDA action limits.

  - Trends

Total DDT:	Nonsignificant decrease
Endrin:	All levels below detection
Dieldrin:	Nonsignificant decrease
Toxaphene:	Significant increase

- GEORGIA

  - Mercury

    A mercury problem was detected in the Savannah River in 1972, but the source was cleaned up and the problem eliminated.

  - PCB

    A major problem developed in the Coosa River where very high concentrations of PCB's were found in various species of fish. The source has since been eliminated, but high residual levels of PCB still remain in the fish tissues. As a result of the contamination, commercial fishing was banned from the confluence of the Etowah and the Coosa to the state line. That ban is still in effect.

    Lake Hartwell was contaminated with PCB's from a source in South Carolina. A warning against the eating of fish from the lake was released but soon rescinded for the portion of the lake located in Georgia.

  - National Pesticide Monitoring Program

    Georgia has two stations in the pesticide network: Savannah River at Savannah and the Altamaha River near Doctortown.

- Concentration

  None above FDA action level.

- Trends

  Total DDT: Altamaha River -- Nonsignificant decrease
  Savannah River -- Significant decrease

  Endrin: Altamaha River -- Nonsignificant decrease
  Savannah River -- Nonsignificant decrease

  Dieldrin: Altamaha River -- Significant decrease
  Savannah River -- Significant decrease

  Toxaphene: Altamaha River -- No trend
  Savannah River -- All samples zero

- KENTUCKY

  - Mercury and Other Heavy Metals

    The state is involved in sediment sampling associated with the Basic Water Monitoring Program and the Stream Use Designation programs. The data from these programs are evaluated by a scheme developed by EPA, Region V. The scheme has three categories ranging from nonpolluted, moderately polluted, and heavily polluted. Each category has a range of values for 19 parameters. This procedure, along with a biological and physiochemical sampling program, have identified problem areas in several regions of the state.

  - PCB

    No known problems in the state.

  - Pesticides

    There are several areas in the state where lindane and pentachlorophenol (PCP) have been detected. The PCP has usually been associated with the wood preservation industry.

There are some elevated levels of chlordane in fish tissues at several locations. These are generally localized problems in urbanized areas which could be attributed to pest control chemicals.

- National Pesticide Monitoring Program

  The only stations associated with the pesticide network located in Kentucky are on the Ohio River. There are nine such stations located along the state's boundary. These are generally located in highly populated areas on both sides of the river making it difficult to isolate particular problems; therefore, no statistical analyses were performed on the data from these stations. While there are areas of elevated concentrations of contaminants in the river, there has been a general improvement in the water quality and community structure of the Ohio over the past few years.

- MISSISSIPPI

  - Mercury

    No known problems.

  - PCB

    No known problems.

  - Pesticides

    Pesticides appear to be a major problem in Mississippi. Areas known to have problems are: Pearl River downstream from Jackson, Okatibbee Creek downstream from Meridian, Town Creek downstream from Tupelo and the Delta lakes in general. Areas under suspicion are the following river basins: Yazoo, Tallahatchee and Sunflower. Data developed from a fish tissue analysis program from these river basins will be available soon.

  - National Pesticide Monitoring Program

    Mississippi has one station in the pesticide network: the Yazoo River near Redwood.

    - Concentration

      DDT and toxaphene are present in total fish residue above the FDA action level for fish fillets.

- Trends

Total DDT:	Nonsignificant decrease
Endrin:	Significant decrease
Dieldrin:	Nonsignificant decrease
Toxaphene:	No trend

- NORTH CAROLINA

  - o Mercury

    Abbot's and Leonard's Creeks are contaminated with mercury. Commercial fishing in the creeks is banned and there is a warning on sports fisheries. The ban and warning do not extend into High Rock Lake.

    There is concern about high levels of mercury in the Pamlico-Albermarle peninsula, and the state will initiate a study of that area next year.

  - o PCB

    The only PCB problem recently was the roadside spill, which has been cleaned up.

  - o Pesticides

    No known problems.

  - o National Pesticide Monitoring Program

    North Carolina has two stations in the pesticide network: Cape Fear River near Elizabethtown and Roanoke River near Roanoke Rapids.

    - Concentration

      There were no average concentrations of pesticide above the FDA action level.

    - Trends

Total DDT:	Roanoke River -- Significant decrease Cape Fear River -- Significant decrease

Endrin: Roanoke River -- Nonsignificant decrease
Cape Fear River -- Nonsignificant decrease

Dieldrin: Roanoke River -- Significant decrease
Cape Fear River -- Nonsignificant decrease

Toxaphene: Roanoke River -- Significant increase
Cape Fear River -- Nonsignificant increase

The pesticide monitoring program also monitors for PCBs, but except for the Roanoke River station, concentrations were very low and declining. Concentrations of PCBs in the Roanoke River, however, increased at a significant upward trend. The uppermost levels were still below FDA action levels for fillets.

- SOUTH CAROLINA

  o Mercury

Elevated levels of mercury were found in fish tissues in the Savannah River in the early 1970's, but subsequent sampling revealed a decline in concentration, and at this time no problem exists.

There were elevated levels of mercury in the water and sediment in Lake Jocassee soon after filling, but it was determined to be natural, and the fishing advisory was lifted in 1979.

High mercury levels are appearing in samples taken along the coast, and the state is investigating to determine whether they are valid.

There are elevated levels of mercury in fish from Edisto River, but these are thought to be natural in origin.

  o PCB

Lake Harwell is contaminated with PCBs from Town Creek. The pollution source was eliminated, but residual PCBs are still present in Lake Hartwell. A sports fish warning is in effect in a portion of the lake. A monitoring program still in effect shows that the concentration of PCBs in fish tissue is diminishing.

o Pesticides

There have been some fish kills connected with the use of toxaphene and endosulfan by tomato farmers. The problem began in late 1970 and is still continuing. Citizen groups are trying to get a ban on the use of endosulfan, which is relatively toxic to warmblooded animals.

o National Pesticides Monitoring Program

South Carolina has two stations in the pesticide network: Pee Dee River near Johnsonville and Cooper River at Lake Moultrie.

- Concentration

  No concentrations above FDA action level.

- Trends

  Total DDT: Cooper River -- Significant decrease
  Pee Dee River -- Nonsignificant increase

  Endrin: Cooper River -- Nonsignificant decrease
  Pee Dee River -- Nonsignificant decrease

  Dieldrin: Cooper River -- Nonsignificant increase
  Pee Dee River -- Significant decrease

  Toxaphene: Cooper River -- Nonsignificant increase
  Pee Dee River -- very low but too sparse to evaluate

- TENNESSEE

o Mercury

North Fork of Holston River is still under a ban for taking fish. The pollution source has been closed, but leakage from holding ponds remains a problem. Clean-up began last year.

- PCB

  Several areas of concern are: Fort Loudon Reservoir near Knoxville, Marine Corps Base at Knoxville, and Beach Creek near Waynesboro.

- Organic Chemicals

  Memphis area -- industrial

  Chattanooga Creek in Chattanooga -- industrial

- Pesticides

  Reelfoot Lake -- last few years of sampling indicate developing problem.

  Mississippi River at Memphis -- Chlordane and other chlorinated hydrocarbons in fish tissue.

- National Pesticide Monitoring Program

  Tennessee has two stations in the pesticide network: Tennessee River near Savannah and Mississippi River near Memphis.

  - Concentrations

    DDT concentrations in fish tissue in the Mississippi exceeded FDA limits in the early sampling but had dropped below 5.0 ppm by 1978.

  - Trends

    Total DDT: Mississippi River -- Significant decrease
    Tennessee River -- Nonsignificant decrease

    Endrin: Mississippi River -- Nonsignificant decrease
    Tennessee River -- Nonsignificant increase

    Dieldrin: Mississippi River -- Nonsignificant increase
    Tennessee River -- Nonsignificant increase

    Toxaphene: Mississippi River -- No trends established. Most values were

zero.
Tennessee River -- Significant increase

b. Point Source Toxicity Testing

Since 1975, toxicity studies have been conducted on effluents from 598 industrial facilities in EPA Region IV. Although all facilities studied had installed BPT facilities, approximately 65 percent (388 sites) were discharging wastes containing substances lethal to aquatic life (Table WQ-1). These data indicate widespread potential for instream damage, and thus additional study is needed at many of these sites.

The Tennessee Department of Public Health reported, as a result of further bioassay testing, the following results as of May 1983. Other states would be expected to confirm similar high percentages of toxic wastes.

Bioassays Performed on Tennessee Dischargers (1978-present)
Static Bioassays

142	Non-toxic (55%)	26	Municipal (10%)
117	Toxic (45%)	233	Industrial (90%)
259		259	

Flow-thru

18	Non-toxic (36%)	12	Municipal (24%)
32	Toxic (64%)	38	Industrial (76%)
50		50	

6. Dissolved Oxygen

Dissolved oxygen depletion is perceived by state officials as a common and persistent problem. The most widespread or serious violations in the Region are along the Atlantic and Gulf Coasts, the lower Mississippi, the Tennessee River basin, and the Ohio River basin. Since municipal sewage and industrial waste are the almost exclusive sources of degradable organic pollutants, low D.O. problems are frequently found downstream from cities and industrial complexes. Improvement programs in wastewater treatment plants and operator training are the main methods of improving D.O.

Nonpoint sources can also contribute significantly to D.O. depletion -- for example, stratified reservoirs and areas where animals are concentrated. The Reservoir Releases Program is a significant method of improving D.O.

7. Nutrients

Excessive nutrients such as phosphorous and nitrogen combined with the south's warm temperatures stimulate the growth of algae and rooted aquatic plants and accelerate eutrophication and oxygen depletion. These effects can result in fish kills, reduced recreational opportunities, and taste and odor problems in water supplies. Nutrient problems are evident in every state in the Region. For example, the Chowan River in North Carolina had experienced severe surface algal blooms, Lake Marion in South Carolina has recently had problems with Elodea and Florida has extensive aquatic weed infestation. The severe nutrient problems in the Region are caused by a combination of factors including industrial and municipal discharges combined with urban and agricultural runoff.

8. Bacterial (Fecal Coliform) Pollution

Bacterial pollution, as indicated by high fecal coliform levels, is widespread through the Region, as indicated on Figure WQ-12. Most bacterial problems are related to inadequate treatment in municipal treatment facilities, and many of the problems indicated will be reduced or eliminated once treatment works now in the planning or construction phases are completed. Poor operation and maintenance of existing facilities and urban runoff, especially from combined sewers, are also common causes of bacterial problems. Many of the indicated problems are on small streams (especially in eastern Tennessee) where the resulting bacterial counts are much more severe than in large streams where ample dilution is available.

Pulp and paper mills also generate high levels of coliforms indistinguishable from those of fecal origin. Chicken processing plants and tanneries, important industries in the Southeast, cause severe but dispersed problems in surface waters. Beef and hog lots and pasturelands are also major contributors to fecal coliform pollution.

Fecal coliforms always indicate a potential health problem, but the most widespread effects of even low bacterial counts are in shellfishing water where harvesting must be greatly restricted. (See also the discussion of Shellfish Waters).

9. pH

The pH problems in Region IV are associated primarily with mining activities. Virtually all the significant pH problems in Kentucky and Tennessee are caused by the exposure of sulfur bearing strata or materials to the weathering process, resulting in acid mine drainage. Some small creeks in eastern Tennessee commonly have a pH as low as 2.

In northern Florida, phosphate mining on Swift Creek produces dissolved solids sufficient that the pH of the Suwannee River increases by 2 pH units downstream from its confluence with Swift Creek. This violates Florida criteria for pH.

Other man-made pH problems in the Region are attributed to agricultural and urban runoff, textile discharges, and overloaded sewage treatment plants. Natural pH depressions are common in blackwater swamp areas of the coastal plain where pH values of 3 to 4 are not uncommon.

Although the Region has several acid-rain-susceptible-lakes (alkalinity below 15 mg/L as $CaCO_3$), there are no widespread problem areas as in the Northeast. Preliminary results show, however, that some lakes in Florida and in the southern Appalachians may be experiencing the first effects of acid rain.

10. Siltation/Turbidity

Siltation is a major economic problem in navigable harbors where turbid fresh water encounters the salt water wedge. The worst of these problems in Region IV is Charleston Harbor, South Carolina, where 10 million cubic yards must be dredged annually just to maintain the harbor. Because of the enormous dredging costs of $14,000,000 per year, the Corps of Engineers is planning to redivert 80 percent of the flow of the Cooper River back to the Santee River, from which it was diverted originally in 1942. Other major dredging problems because of siltation are shown in Figure WQ-15. Many other areas not shown require annual dredging of one-half million cubic yards per year or less. On rivers such as the Mississippi, especially, and the Ohio, Tennessee and Cumberland to a lesser extent, most of the dredged material is simply dumped back into the river, and data for comparisons are not available.

Mining and agriculture are the primary localized causes of siltation in Region IV. Virtually every stream on the Piedmont has persistent turbidity because of colloidal clay, and the total suspended sediment load of these streams is variable depending the amount of construction, agriculture, clear-cutting or other activities carried out in the watersheds. Construction of highways, residential sub-divisions, and industrial facilities also frequently contributes harmful quantities of silt to surface waters during rainy periods.

The siltation problem in the mining areas of Kentucky and Tennessee also correspond to low pH problems and concentration of lead, zinc, mercury, cadmium, iron and other metals. For example, siltation in the Ocoee River in eastern Tennessee is the result of a copper smelting operation at Copper Hill. In years past, the entire valley was denuded of vegetation by sulfuric fumes from the smelting. The ensuing erosion was so severe that the area was aptly described as a "moonscape". Recovery is slowly progressing through extensive conservation measures, but siltation is still a problem in the Ocoee River.

11. Shellfishing

Shellfishing is a profitable commercial activity in the six coastal states of Region IV, which include 27.4 percent of the nation's total estuarine waters. Since shellfish are consumed by humans, the waters in which they live are carefully monitored for pollutants. The national trend in shellfish waters approved for commercial shellfish harvesting has increased from 38.7 percent in 1966 to 52 percent in 1980 (a 13.3% increase) according to the 1980 National Shellfish Register. If this trend is assumed to be a result of increased water pollution abatement programs, then the upward trend should continue unless these programs are reduced. Region IV, however, is slightly behind the national average with 34.9 percent in 1966 increasing to 48.4 percent in 1980 (a 13.5% increase). The acreage and status of shellfish harvesting waters for our six coastal states and for the Region as a whole, according to the 1980 National Shellfish Register of Classified Estuarine Waters, are shown in Figures WQ-16 and WQ-17 and the table below. The following definitions apply.

- Open - These areas are available for shellfish harvesting at all times of the year without restriction.
- Conditional - This category includes some slightly polluted areas which may be used for shellfish cultivation or harvesting if the shellfish are then placed in clean water for a period of time before marketing. This allows the shellfish to cleanse themselves of bacteria, thus negating the impact of moderate pollution levels. Note however, that this procedure is not effective for shellfish from heavily polluted areas. This category also includes areas that are open for shellfish harvesting on a seasonal basis. In certain seasons, polluted conditions make them unavailable for shellfish harvesting.
- Closed - Shellfish cultivation and harvesting is forbidden in these areas at all times because of polluted conditions.

Classification of Waters in Acres

State	Open	Conditional	Closed
North Carolina	1,769,049	0	356,565
South Carolina	205,401	908	73,154
Georgia	53,651	0	150,436
Florida	512,577	110,281	292,484
Alabama	73,919	193,468	103,736
Mississippi	120,201	171,213	98,840
TOTAL	2,734,798	475,870	1,075,215

North Carolina had a greater increase in approved waters than any other state. North Carolina followed the upward U.S. trend, but exceeded the average. South Carolina continued the upward trend begun in 1971 and paralleled the present U.S. pattern of increased approved area acreage and decreased prohibited area acreage. Georgia followed the U.S. trend, also, with an increase in approved waters and a decrease in prohibited area waters. Shellfish waters in Georgia are only opened when an area is proposed for harvesting. Many areas are simply not monitored that probably could be opened if there was sufficient demand. Florida has shown great changes in the past five years. Approved area waters decreased by nearly 150,000 acres, whereas about 730,000 acres of prohibited waters were declassifed and put into the NS/NP category. Alabama did not follow the U.S. trend; it lost approved area acreage. Most of the state waters are classified as conditional. Mississipi has recently classified large areas of the Mississippi Sound for the purpose of relaying shellfish. As in Alabama, most of the waters are classified as conditional. The state did not follow the U.S. trend.

Within Region IV, large areas of shellfish waters are often located adjacent to sewered population areas from which treated wastewaters must be discharged. Examples are Mobile, Alabama; the Mississippi Gulf coast; St. Augustine, Florida; and Apalachicola, Florida. Because the Food and Drug Administration (FDA) has overview jurisdiction of state agencies charged with opening or closing the shellfish harvesting beds, EPA must consult with the FDA when sewerage facility plans are developed for these areas.

12. Lakes & Reservoirs

Seven Region IV states (Alabama did not participate) have taken advantage of Section 314 matching funds to identify and classify the condition of publicly owned freshwater lakes. A total of 1034 natural lakes and impoundments encompassing 3,268,153 acres were studied (Table WQ-2).

A variety of problems were identified at 376 (36%) of the lakes and impoundments studied (Table WQ-3). The five problems most frequently encountered were weed infestation, hypolimnetic oxygen deficits, sedimentation, nuisance algal blooms and fishkills. Nutrient loading, both point source (41 lakes) and non-point (87 lakes), was identified as a factor contributing to the problems identified. Sedimentation and turbidity were serious problems resulting from improper land use at approximately 100 lakes studied. Most of the exotic problems (19 lakes) were found in Tennessee and Mississippi, and likely resulted from agricultural pesticides in runoff from the intensively farmed Mississippi Delta.

Recreational use was impaired on 424,860 acres (13% of total acreage) of lakes and impoundments in the 7 southeastern states studied.

A total of 238 urban lakes, encompassing 110,139 acres, were studied. Sixty-seven (28%) of the urban lakes totaling 80,096 acres (73% of the total acreage) have problems that need to be addressed. Weed infestations, sedimentation, nuisance algal blooms, depleted oxygen, fishkill and turbidity head the list of problems encountered at urban lakes. (Table WQ-3)

The data reported in Table WQ-2 point out, not that the problems are necessarily different from state to state, but that each state perceives the problems differently. Interpreting the data requires a judgment call by each state. Tennessee, for example, takes a much stricter position than some other states; hence, the table makes Tennessee look inordinately bad.

13. Oceans

a. Ocean Disposal of Dredged Material

The EPA shares responsibilities with the Corps of Engineers to administer the program for ocean disposal of dredged materials through the Marine Protection, Research, and Sanctuaries Act of 1972. In Region IV, 43 dredged material disposal sites have been given interim site designations. A consent decree stipulated that 10 of these sites would have EIS's prepared and Final Site Designations implemented. The remaining 33 sites must also receive Final Site Designations in the future. All of these sites receive material from navigation channels and harbors that must remain operational for economic reasons. All regional ports compete with each other to some extent and most wish to have deeper channels for servicing larger and deeper draft vessels.

b. Ocean Discharge

(1) EPA's authority under Section 403 of the Clean Water Act provides guidelines for issuing NPDES permits to dischargers to the territorial seas, the contiguous zone, and the oceans. Section 301(h) authorizes EPA to grant variances for federal minimum secondary treatment requirements for municipal discharges to marine waters.

(2) Number of Discharges

In Region IV, there are approximately twenty-five permitted discharges to the Atlantic Ocean or the Gulf of Mexico. Approximately fifteen of these are for minor, near-shore discharges, seven are for major municipal discharges, and three are for power plants. All but one are in Florida. Offshore oil and gas related discharges are not included in these figures.

(3) 301(h) Waivers

In Region IV, eight applications for Section 301(h) variances were received prior to the 12/29/82 deadline, including one estuarine discharge and one proposed new discharge. Seven of the eight are large discharges, and all will require additional field work to support the variance requests. Based on EPA's experience with the first round 301(h) applications, it is estimated that the time for field work and EPA review will take two or more years prior to a decision on approval or denial of the variance requests.

Impacts of ocean discharges are evaluated at the time of a 403 or 301(h) determination, prior to NPDES permits issuance. Data obtained from permittee monitoring are reviewed periodically, as required by the permit, or at permit renewal.

(4) Outer Continental Shelf (OCS) - Drilling Impacts

The Alabama and Mississippi state staffs and the regional staff have expressed concern over possible environmental impacts to state waters in the near shore coastal zone by drilling fluids and other discharges from the rigs. These wastes are known to be toxic to organisms. Efforts are underway to develop a study plan that will determine the fate of these fluids in this system. When a plan is completed the industry will be asked to perform the studies. The industry has adamantly stated that they want the regulatory agencies to participate in this study; therefore, resources needed from EPA may include the OSV ANTELOPE and a portion of a scientific crew.

Significant finds of hydrocarbons on the OCS will require pipelines to transport the material ashore. These structures would have varied impacts to the beaches, dunes, wetlands and other coastal habitats. Mitigation measures to reduce these impacts should be developed and monitoring programs to evaluate long term impacts should be implemented.

(5) Sewage Sludge

There is currently no municipal entity disposing of sewage sludge via ocean dumping in Region IV. The states bordering on the Atlantic Ocean could be considered possible candidates for such a disposal technique. Two areas where ocean dumping of sewage sludge has even been considered to any extent are the Jacksonville and the Ft. Lauderdale areas of Florida. In the case of Ft. Lauderdale, current plans indicate that a joint compost disposal technique with the City of Hollywood is the most feasible alternative. In Jacksonville, the development of sludge disposal alternatives is being conducted now. Various disposal techniques are under review. Preliminary discussions have recently been held regarding the possible ocean disposal of municipal sludge from Charleston, S.C.

(6) Outer Continental Shelf (OCS) - NPDES Permits

Within the last few years the oil and gas industry has begun drilling wells in the eastern Gulf of Mexico; this year wells are being drilled just outside of state waters of Mississippi and Alabama. Permits for discharges from drilling activities at the rigs are issued under the NPDES of the Clean Water Act. Presently, there are five new permits for wells within 6.7 miles of these state waters. Should finds be made at these wells, production platforms and pipelines will further impact this coastal system. With recent discoveries of hydrocarbons in Mobile Bay and the Delta areas, the trend is for abundant infrastructures as are presently in Texas and Louisiana.

c. Future Programs

(1) Ocean Disposal of Dredged Materials

Dredge material disposal will continue to require Regional resources for permit reviews and site determination. Evaluation of the 10 sites proposed for final designation must be implemented along with EIS's and Final Designations for the additional 33 existing interim sites. The EIS's can be developed by the EPA or the Corps of Engineers. It remains undetermined at this time which agency will prepare the EIS's. That agency providing resources will probably be the one responsible for the EIS's. Certain of these sites should be monitored in order to evaluate the fate and effects of dredged material disposal; again, this could be performed by the EPA, the Corps of Engineers, or the National Oceanic and Atmospheric Administration. Region IV prefers to assume this monitoring responsibility. This effort will require resource commitments which should be provided for in personnel ceilings.

(2) Monitoring of Ocean Discharges

Section 403 authorizes EPA to impose permit conditions requiring effluent analysis, bioassay analysis, and field studies. Section 301(h) variance applicants must develop a monitoring program providing for effluent monitoring, water quality monitoring, and biological monitoring. EPA review and approval of the monitoring program is part of the 301(h) process. Successful applicants will be required to implement the monitoring programs.

State regulatory agencies would be reluctant to permit ocean dumping of sewage sludge because of its unknown impacts. In all likelihood, EPA Region IV would require the preparation of a generic Environmental Impact Statement on ocean dumping of sewage sludge before it would be allowed. Individual EIS's would be required for site-specific projects.

14. Future Outlook

In the future, water quality problems in Region IV are likely to intensify more than in most areas of the country because of anticipated population, industrial, and agricultural growth. Current trends in land use, changing from rural to urban, increase the pressures on water quality. Locations where environmental issues are expected to be most intense are:

- Coastal zone areas, especially Florida, Mississippi and Mobile Bay, from multiple sources.
- Coastal areas of North Carolina from the rapid, recent conversion of lowlands and wetlands to "superfarms."
- Appalachian region of Kentucky and Tennessee from mining, gas and oil industry and oil shale development in eastern-central Kentucky.

- Piedmont in the Carolinas from urban and industrial development.

- The Tennessee-Tombigbee Waterway because of extensive anticipated industrial growth in the area. In addition, the capacity of existing streams has been greatly reduced by channelization, and heavy industrialization already exists on the portion of the Tennessee River that will flow into the Waterway. The potential development of lignite mining in northeast Mississippi may further exacerbate these environmental problems.

- The Mississippi Delta area where wetlands clearing and pesticide residues will continue to be significant problems.

TABLE WQ-1 TOXICITY OF INDUSTRIAL WASTES (1975-1982)

Agency	No Facilities	No. Effluent Lethal	%Lethal
EPA	352	250	71
TN	150	84	56
FL	69	37	54
SC	27	17	63
TOTAL	598	388	65

Table WQ-2

STATUS OF LAKES AND IMPOUNDMENTS IN REGION IV

	TN	MS	NC	KY	SC	GA	FL	AL	REGIONAL TOTAL
Number of Lakes Surveyed	109	24	62	46	40	173	580	NIA*	1,034
Total Known Surface Area in Acres	682,516	129,359	227,752	353,353	447,802	387,169	1,040,202	NIA	3,268,153
Type:									
Impoundment	108	24	49	46	40	170	5	NIA	442
Natural Lake	1	0	13	0	0	3	575	NIA	592
Location:									
Urban	15	1	17	4	5	50	111	NIA	203
Rural	94	23	45	42	35	123	464	NIA	821
Problems:									
Weeds	3	3	9	2	16	13	88	NIA	134
Hypolimnion Dissolved Oxygen Depletion	70	0	0	1	12	7	0	NIA	90
Sedimentation	9	5	22	0	19	8	0	NIA	63
Nuisance Blooms	21	0	0	3	3	13	20	NIA	60
Fishkills	11	0	0	0	0	4	33	NIA	48
Turbidity or Solids	12	10	0	4	4	11	0	NIA	41
Dissolved Oxygen	18	0	0	2	0	5	5	NIA	30
pH	24	0	0	1	0	0	0	NIA	25
Toxics	10	9	1	0	0	0	0	NIA	20
Coliform	16	0	0	0	0	2	0	NIA	16
Temperature	15	0	0	0	1	0	0	NIA	16
Taste & Odor	6	0	0	1	0	0	0	NIA	7
Color	4	0	0	0	0	0	0	NIA	4
Oils	1	0	0	0	0	1	0	NIA	2
Number of Lakes with No Serious Problems	1	0	34	36	7	146	434	NIA	658
Recreational Use:									
Number of Lakes	13	0	12	10	9	3	NIA	NIA	47
Percent of Total Acres Impaired	1	0	8	2	1	1	NIA	NIA	13

*NIA = No Information Available

Table WQ-3

URBAN LAKES

STATE	NUMBER	TOTAL ACRES	PROBLEM LAKES		TOP 3 PROBLEMS			RECREATIONAL IMPAIRMENT		IMPAIRMENT PROBLEMS
			NUMBER	ACRES	1	2	3	NO.	ACRES	
Tennessee	15	7,430	14	7,428	Depleted Dissolved Oxygen in Hypolimnion	Nuisance Blooms	Fishkills	1	14.2	Coliform, Dissolved Oxygen, Non-point
Mississippi	1	33,000	1	33,000	Weeds	—	—	0	0	
North Carolina	17	9,783	10	2,120	Sediment	Weeds	—	5	543.6	Sediment/Weeds
Kentucky	4	324	1	51	Dissolved Oxygen	Weeds	Nuisance Blooms	1	51	Weeds/Blooms
South Carolina	5	12,908	5	12,908	Weeds	Sediment	Turbidity	2	550	Weeds
Georgia	50	2,368	15	1,625	Blooms	Weeds	Turbidity	0	0	—
Florida	146	44,326	21	22,964	Weeds	Fishkills	Nuisance Blooms	NIA*	NIA	NIA
Alabama	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
TOTALS	238	110,139	67	80,096				9	1158.8	

*NIA - No information available

201 FUNDING 1973-82

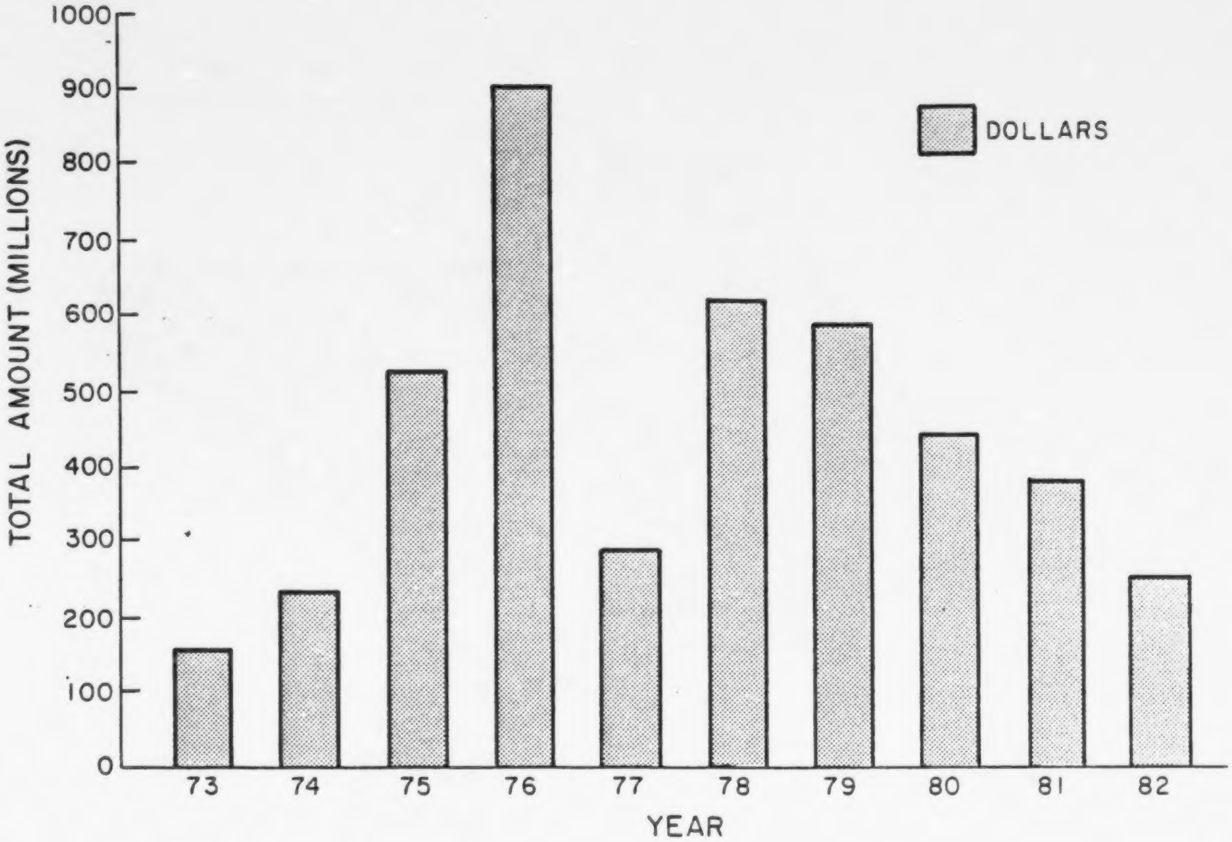
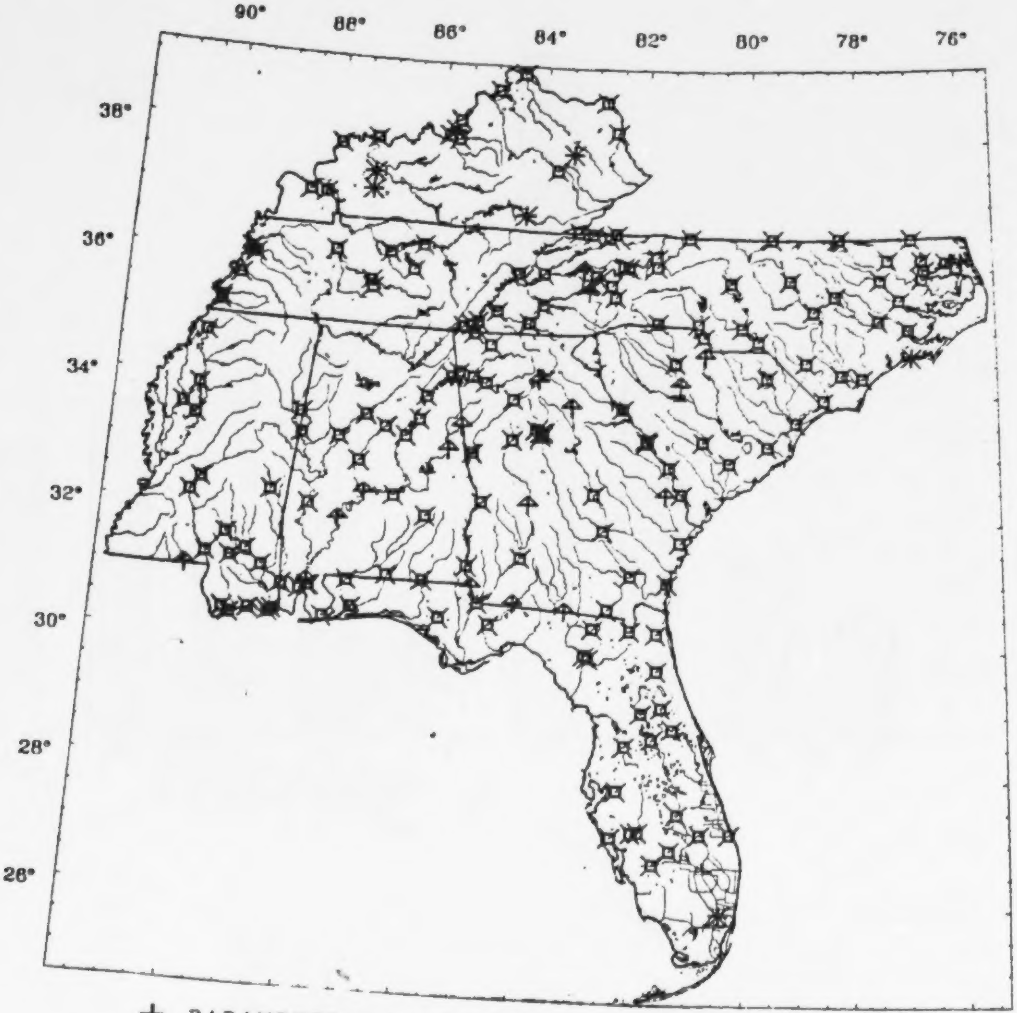


Figure WQ - 1

STATIONS WHERE DESIGNATED USE OF 'FISHABLE/SWIMMABLE' IS SUSPECTED OF BEING IMPAIRED

BASED ON AVAILABLE MONITORING DATA FOR 1980-81
REGION 4



+ PARAMETER NOT MEASURED OR
NOT INCLUDED IN STATION CRITERIA

↑ NEGLIGIBLE--FOR EACH DESIGNATED USE,
IMPAIRMENT VALUE IS 0 - .99

⌧ MODERATE--FOR AT LEAST ONE DESIGNATED USE,
IMPAIRMENT VALUE IS 1 - 9.9

✳ SEVERE--FOR AT LEAST ONE DESIGNATED USE,
IMPAIRMENT VALUE IS 10 & UP

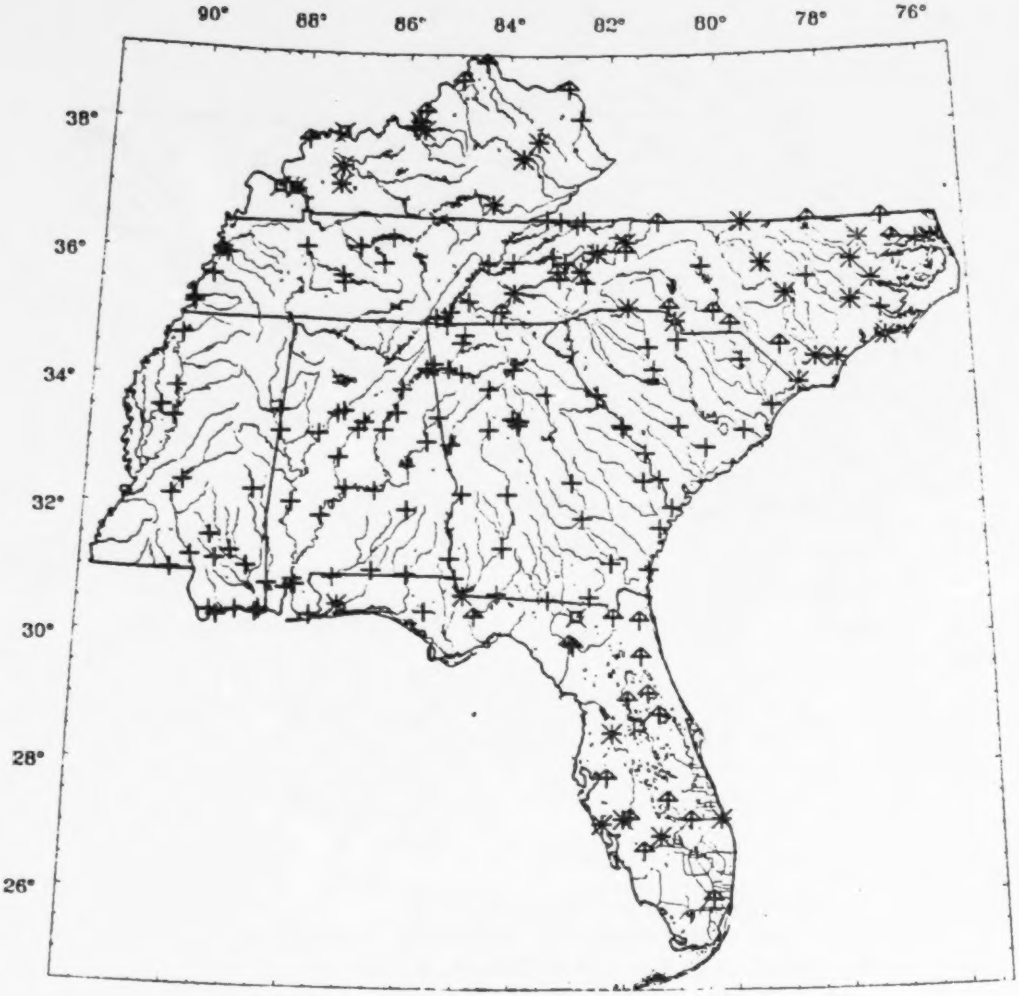
FIGURE WQ-2

OAK RIDGE GEOGRAPHICS

STATIONS WHERE TOXICS ARE SUSPECTED OF CONTRIBUTING TO USE IMPAIRMENT PROBLEMS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4



- + PARAMETER NOT MEASURED OR NOT INCLUDED IN STATION CRITERIA
- ▲ NEGLIGIBLE--IMPAIRMENT VALUE IS 0
- ☒ MODERATE--IMPAIRMENT VALUE IS .01 - .99
- ✳ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

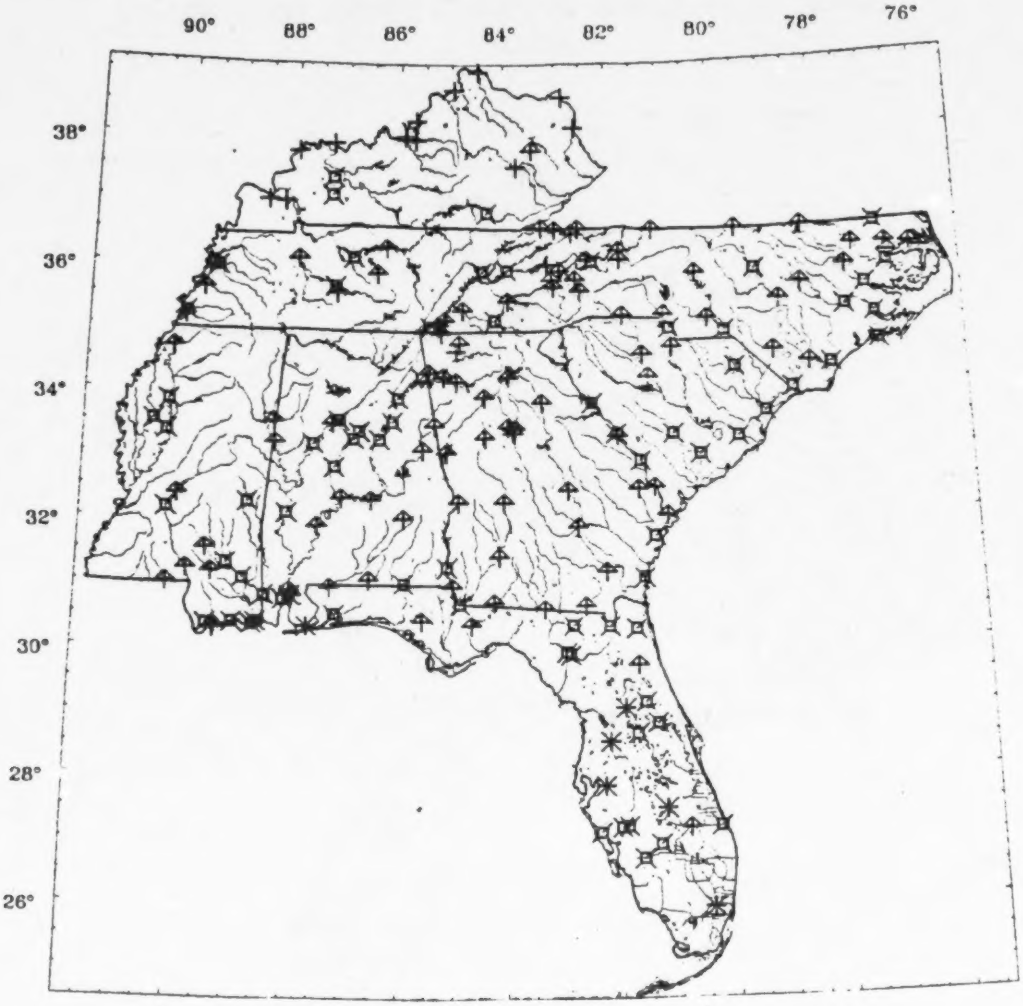
OAK RIDGE GEOGRAPHICS

FIGURE WQ-3

STATIONS WHERE LOW DISSOLVED OXYGEN IS SUSPECTED OF CONTRIBUTING TO USE IMPAIRMENT PROBLEMS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4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+ PARAMETER NOT MEASURED OR
NOT INCLUDED IN STATION CRITERIA

↑ NEGLIGIBLE--IMPAIRMENT VALUE IS 0

▣ MODERATE--IMPAIRMENT VALUE IS .01 - .99

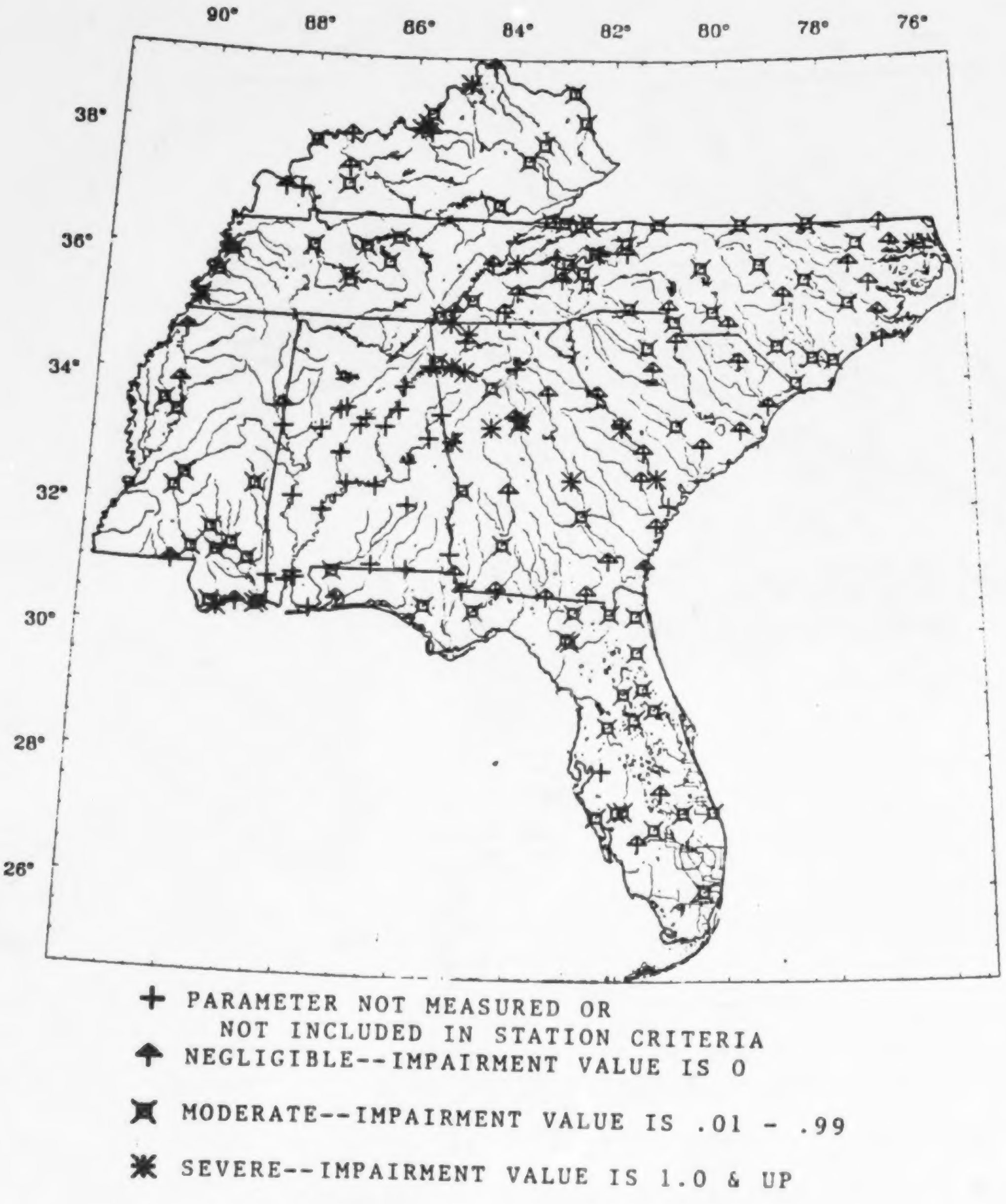
✳ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

FIGURE WQ-4

STATIONS WHERE FECAL COLIFORMS ARE SUSPECTED OF CONTRIBUTING TO USE IMPAIRMENT PROBLEMS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4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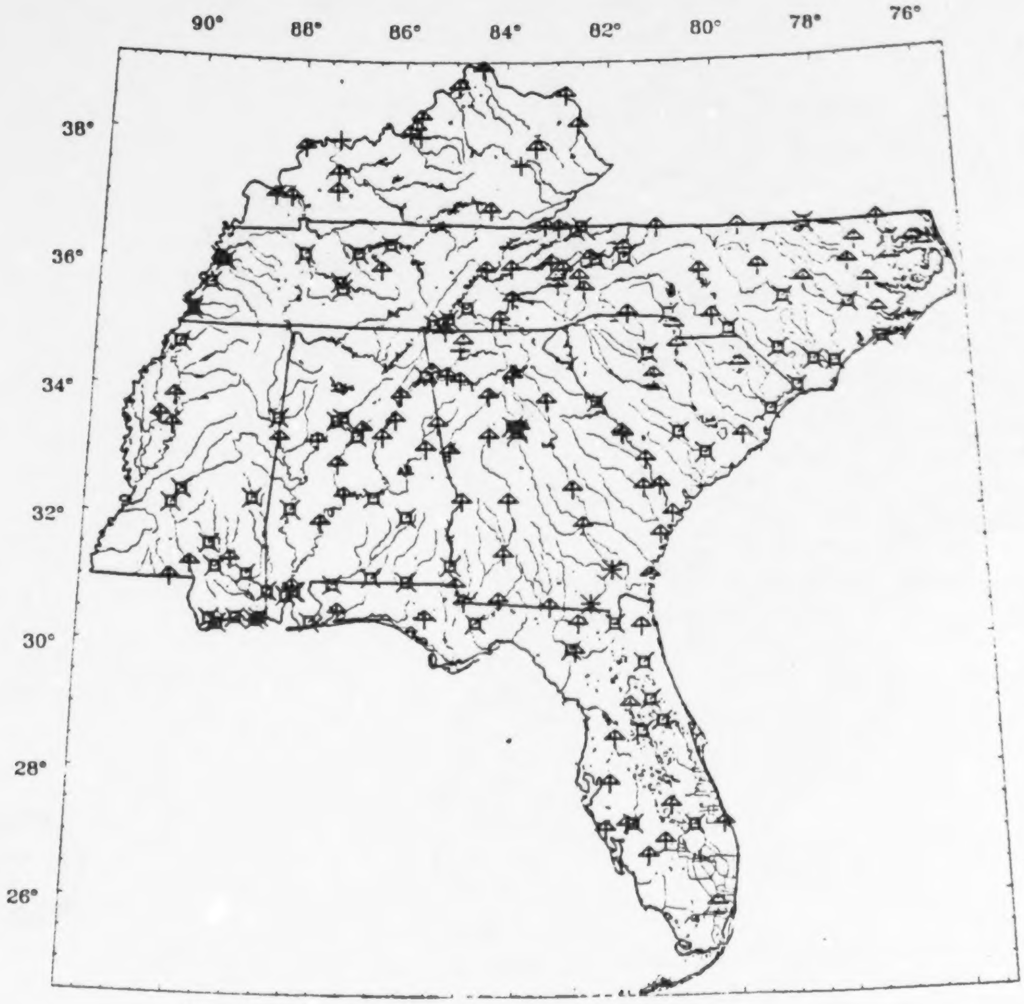
+ PARAMETER NOT MEASURED OR NOT INCLUDED IN STATION CRITERIA
↑ NEGLIGIBLE--IMPAIRMENT VALUE IS 0
☒ MODERATE--IMPAIRMENT VALUE IS .01 - .99
✱ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

FIGURE WQ-5

STATIONS WHERE LOW PH IS SUSPECTED OF CONTRIBUTING TO USE IMPAIRMENT PROBLEMS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4



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+ PARAMETER NOT MEASURED OR NOT INCLUDED IN STATION CRITERIA

⬆ NEGLIGIBLE--IMPAIRMENT VALUE IS 0

▣ MODERATE--IMPAIRMENT VALUE IS .01 - .99

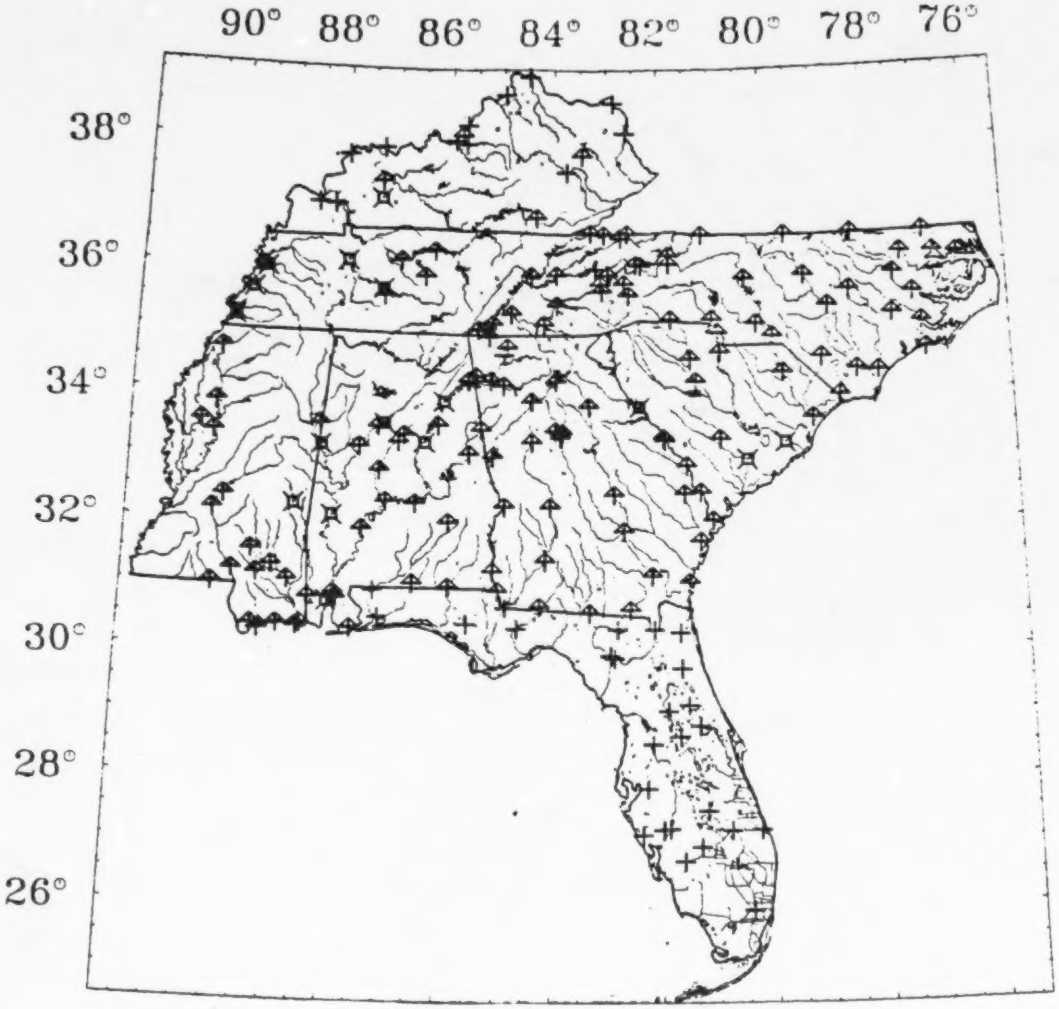
✳ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

FIGURE WQ-6

STATIONS WHERE TEMPERATURE IS SUSPECTED OF CONTRIBUTING TO USE IMPAIRMENT PROBLEMS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4



+ PARAMETER NOT MEASURED OR
NOT INCLUDED IN STATION CRITERIA

↑ NEGLIGIBLE--IMPAIRMENT VALUE IS 0

▣ MODERATE--IMPAIRMENT VALUE IS .01 - .99

✳ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

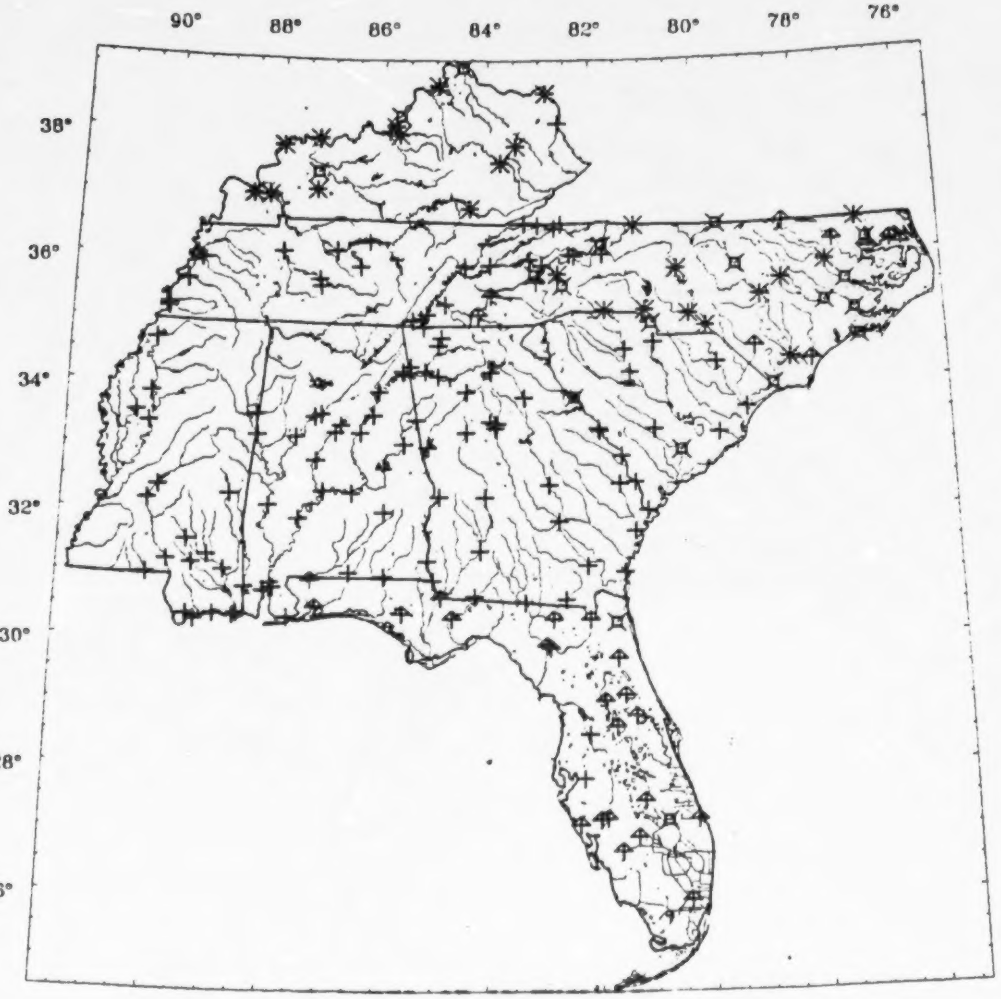
OAK RIDGE GEOGRAPHICS

FIGURE WQ-7

STATIONS WHERE TURBIDITY, DISSOLVED SOLIDS, FE, MN, AND OIL & GREASE ARE SUSPECTED POLLUTANTS

BASED ON AVAILABLE MONITORING DATA FOR 1980-81

REGION 4



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- + PARAMETER NOT MEASURED OR NOT INCLUDED IN STATION CRITERIA
- ↑ NEGLIGIBLE--IMPAIRMENT VALUE IS 0
- ⊠ MODERATE--IMPAIRMENT VALUE IS .01 - .99
- ✱ SEVERE--IMPAIRMENT VALUE IS 1.0 & UP

FIGURE WQ-8

MAJOR TOXICS PROBLEM AREAS IN REGION IV

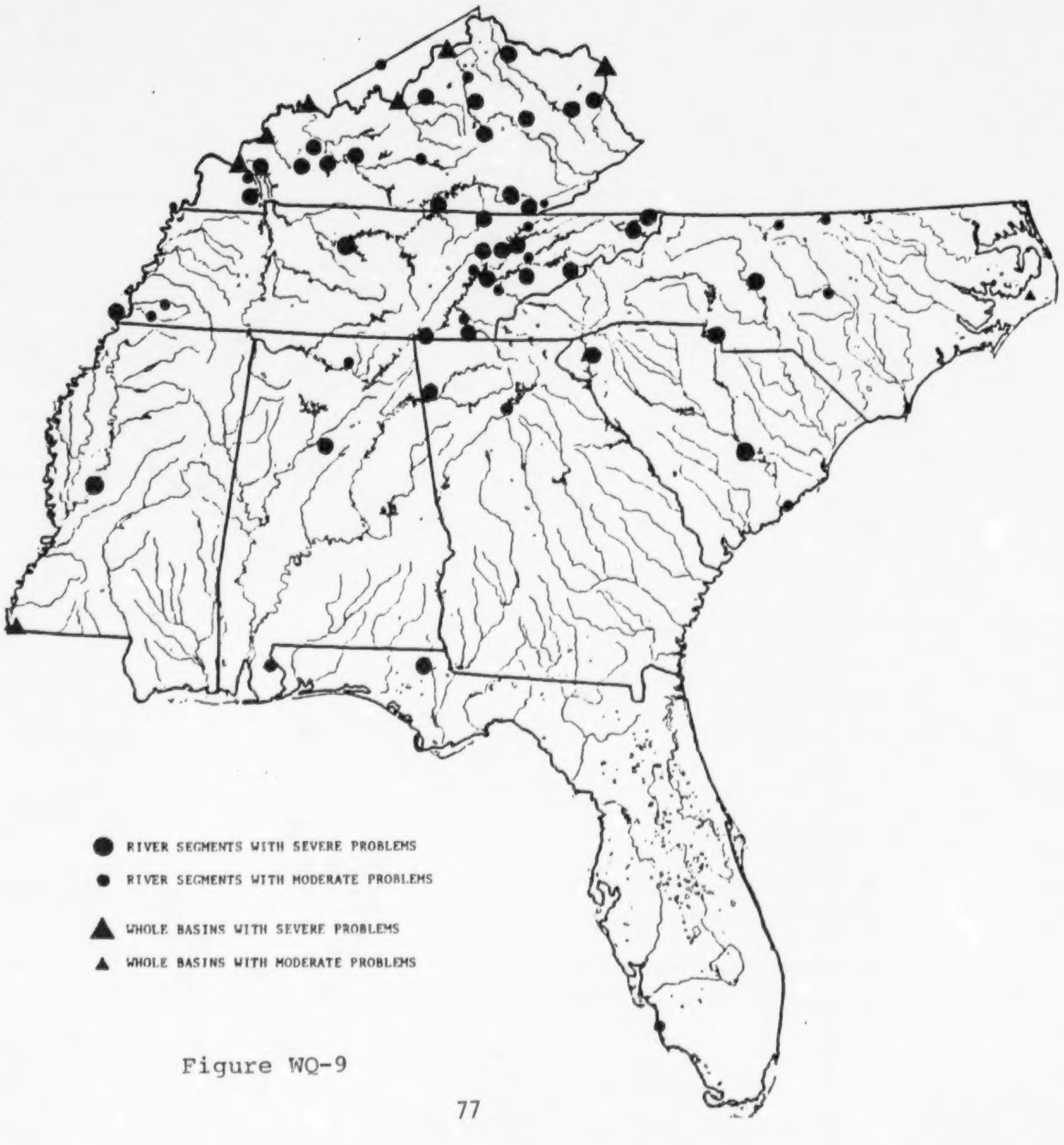

● RIVER SEGMENTS WITH SEVERE PROBLEMS
● RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▲ WHOLE BASINS WITH MODERATE PROBLEMS

Figure WQ-9

MAJOR LOW DISSOLVED OXYGEN PROBLEM AREAS IN REGION IV

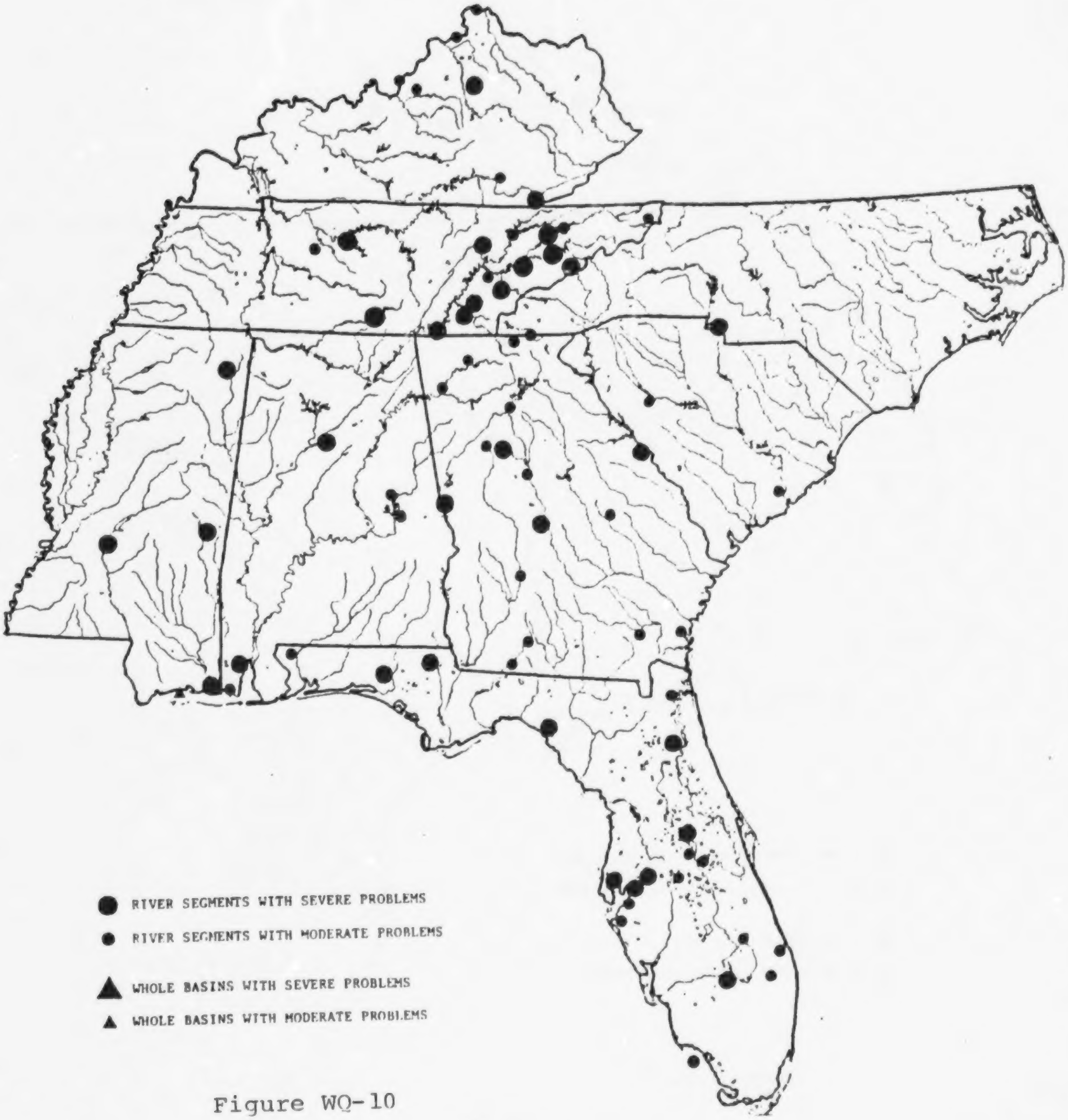

● RIVER SEGMENTS WITH SEVERE PROBLEMS
● RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▲ WHOLE BASINS WITH MODERATE PROBLEMS

Figure WQ-10

MAJOR NUTRIENTS PROBLEM AREAS IN REGION IV

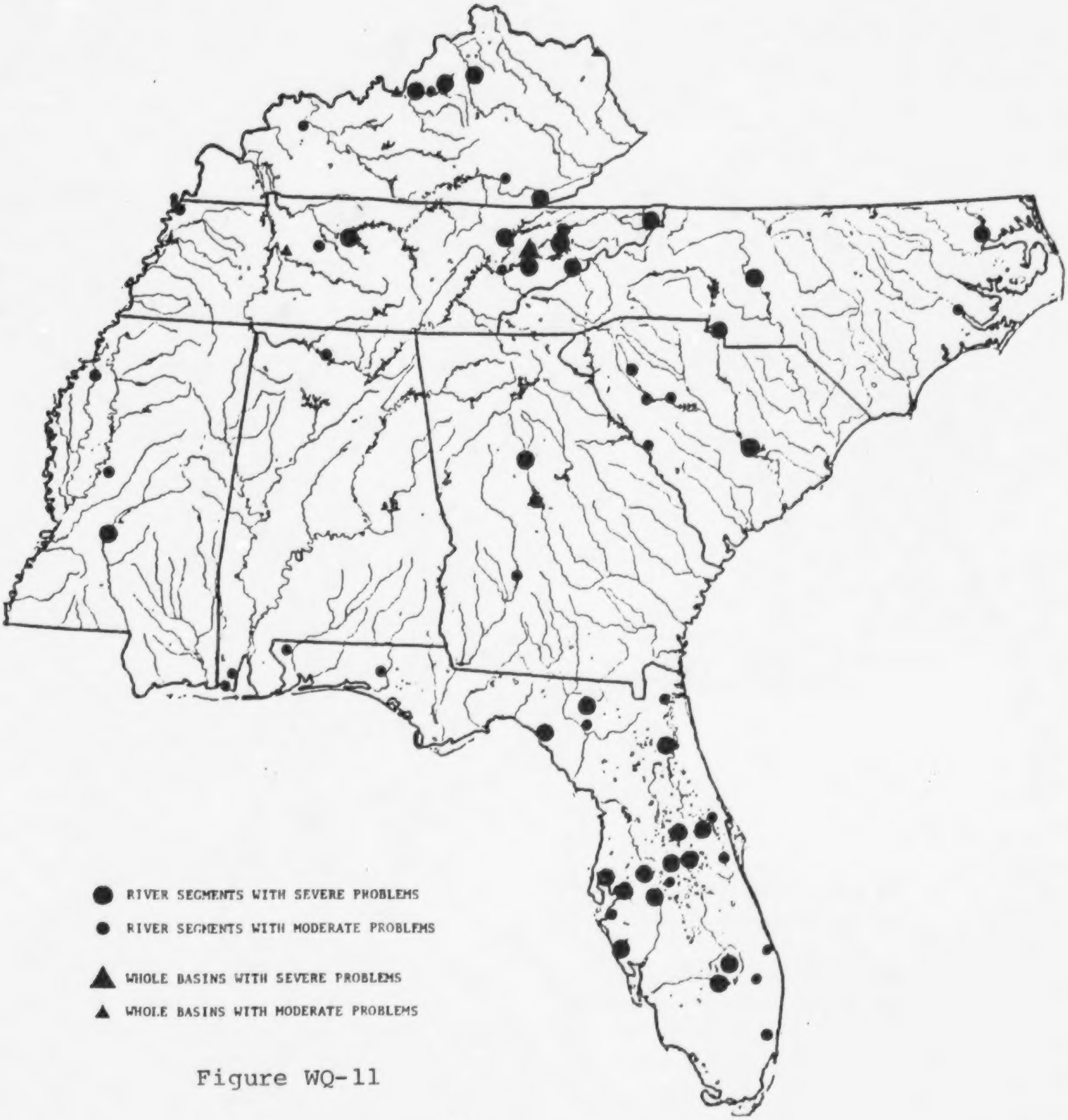

● RIVER SEGMENTS WITH SEVERE PROBLEMS
● RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▲ WHOLE BASINS WITH MODERATE PROBLEMS

Figure WQ-11

MAJOR BACTERIAL PROBLEM AREAS IN REGION IV

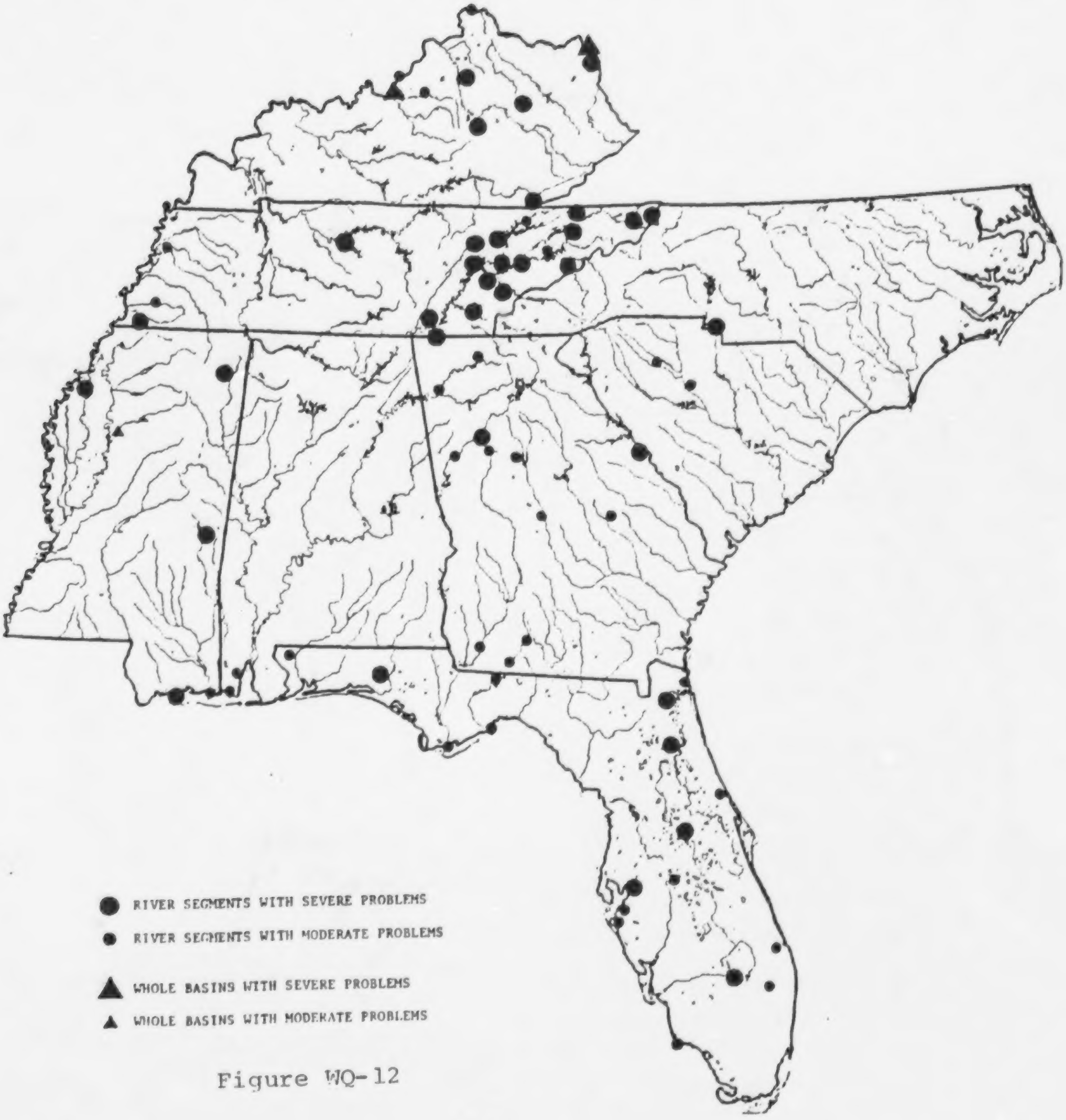

● RIVER SEGMENTS WITH SEVERE PROBLEMS
• RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▲ WHOLE BASINS WITH MODERATE PROBLEMS

Figure WQ-12

MAJOR PH PROBLEM AREAS IN REGION IV

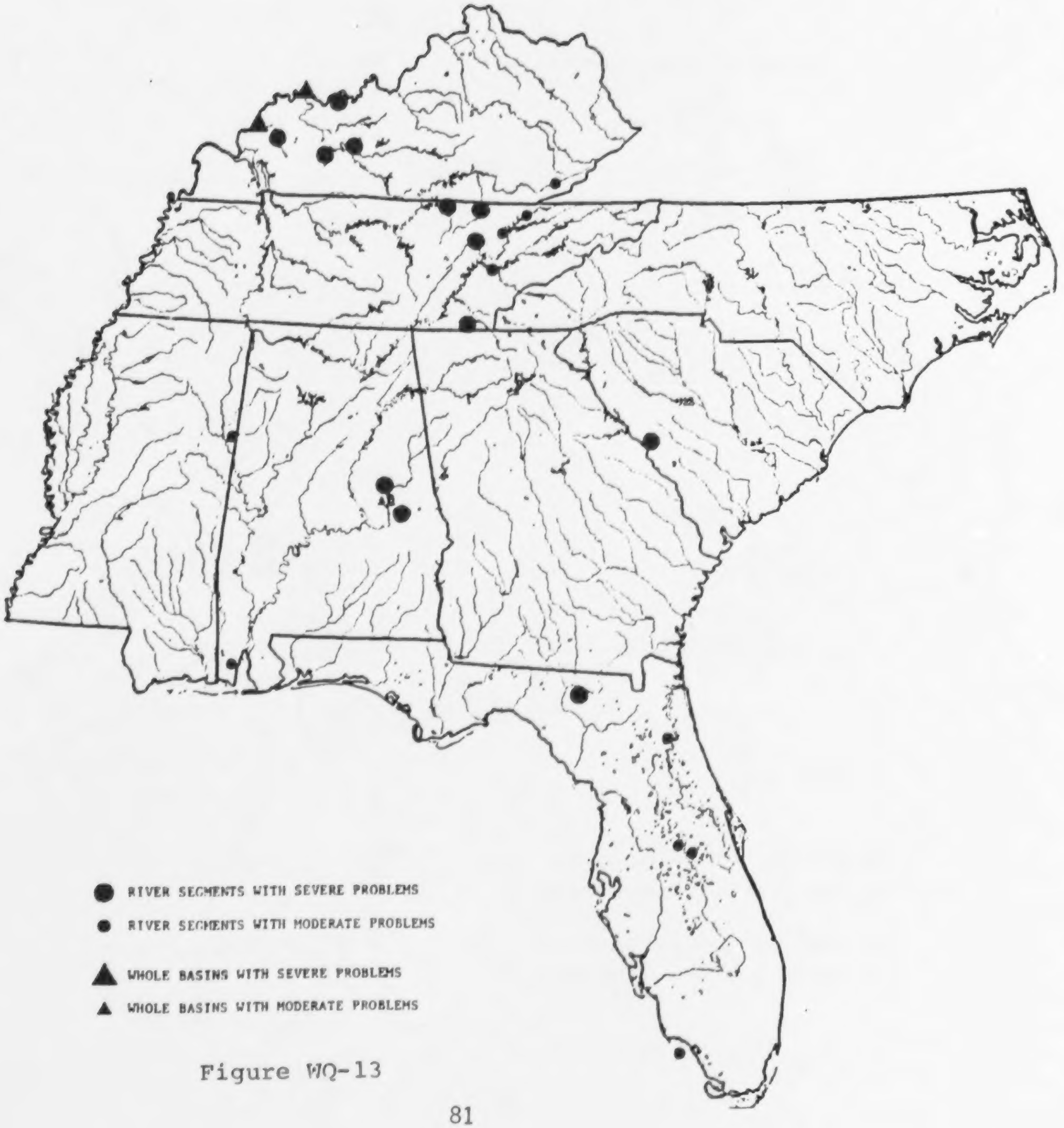

● RIVER SEGMENTS WITH SEVERE PROBLEMS
● RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▲ WHOLE BASINS WITH MODERATE PROBLEMS
AB

Figure WQ-13

MAJOR SILTATION PROBLEM AREAS IN REGION IV

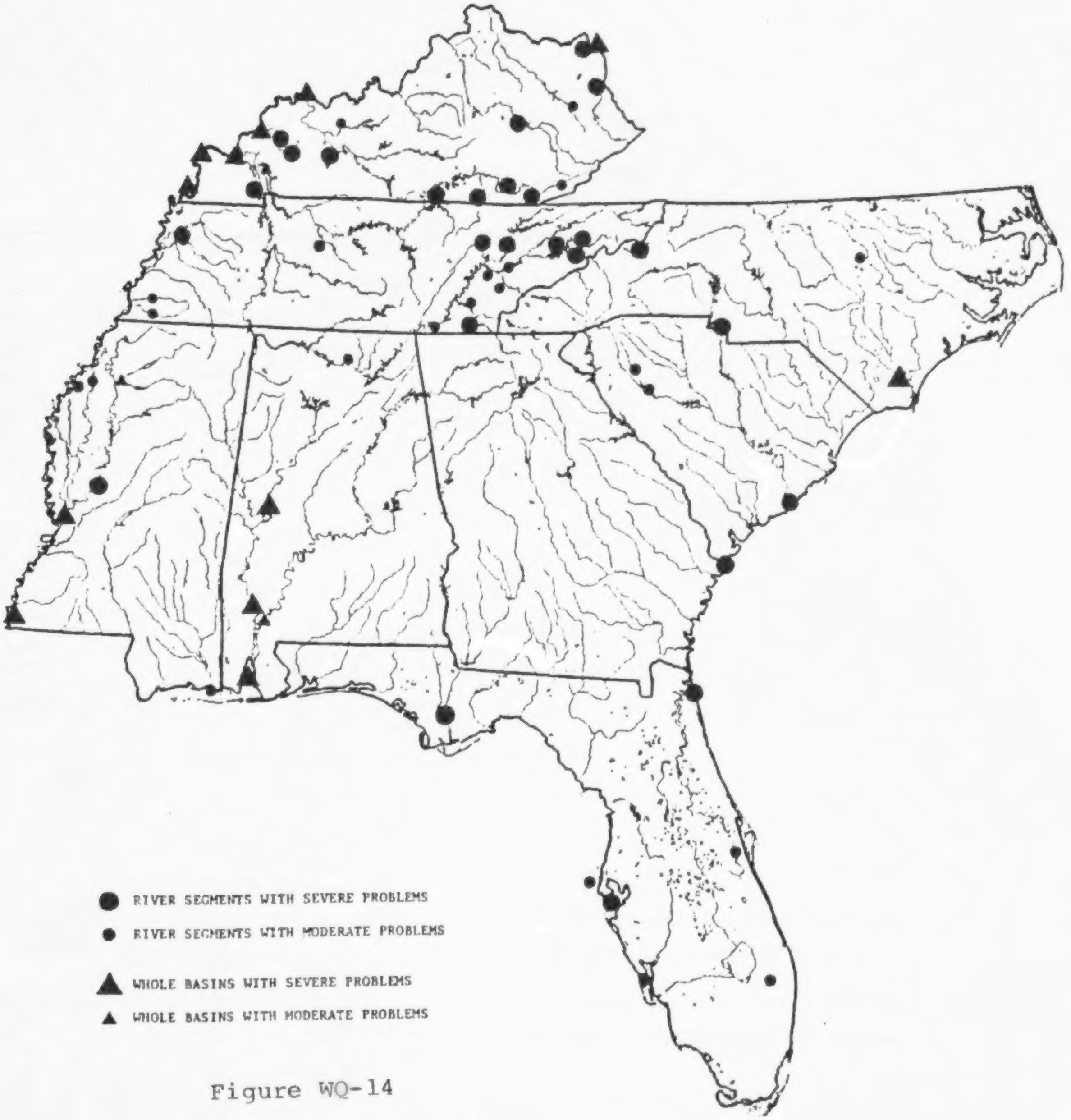

● RIVER SEGMENTS WITH SEVERE PROBLEMS
• RIVER SEGMENTS WITH MODERATE PROBLEMS
▲ WHOLE BASINS WITH SEVERE PROBLEMS
▴ WHOLE BASINS WITH MODERATE PROBLEMS

Figure WQ-14

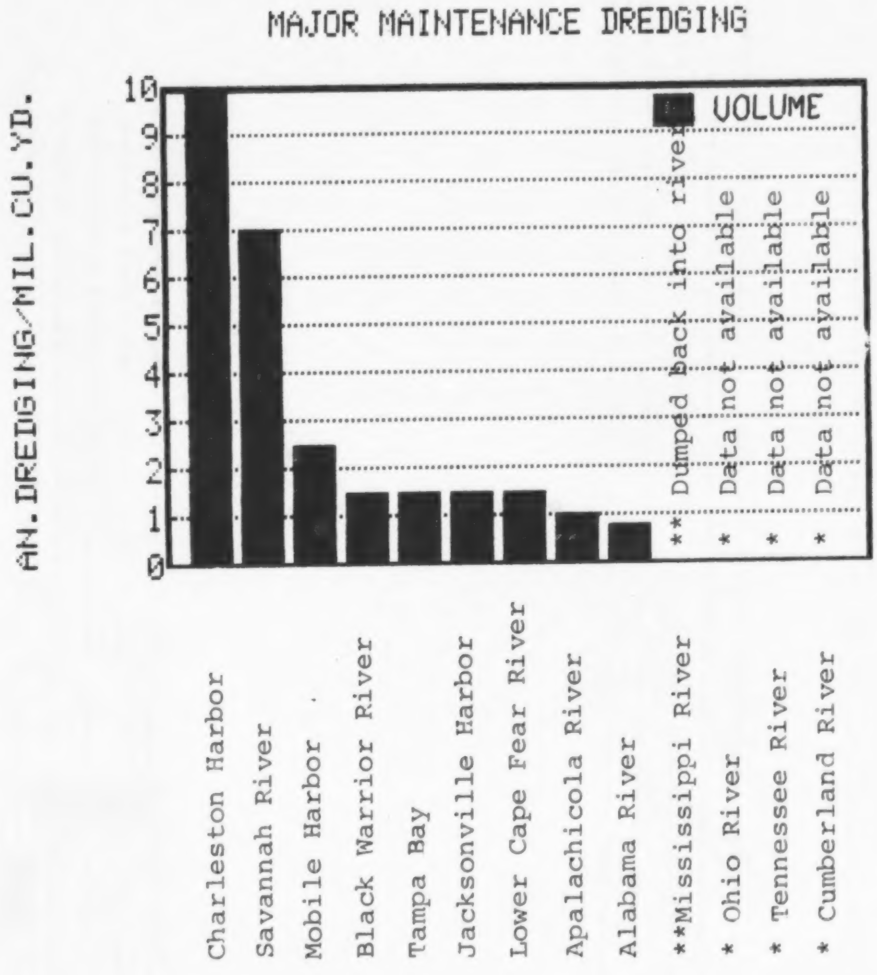

MAJOR MAINTENANCE DREDGING
AN. DREDGING/MIL. CU. YD.
0
1
2
3
4
5
6
7
8
9
10
■ VOLUME
** Dumped back into river
* Data not available
* Data not available
* Data not available
Charleston Harbor
Savannah River
Mobile Harbor
Black Warrior River
Tampa Bay
Jacksonville Harbor
Lower Cape Fear River
Apalachicola River
Alabama River
**Mississippi River
* Ohio River
* Tennessee River
* Cumberland River

Figure WQ - 15

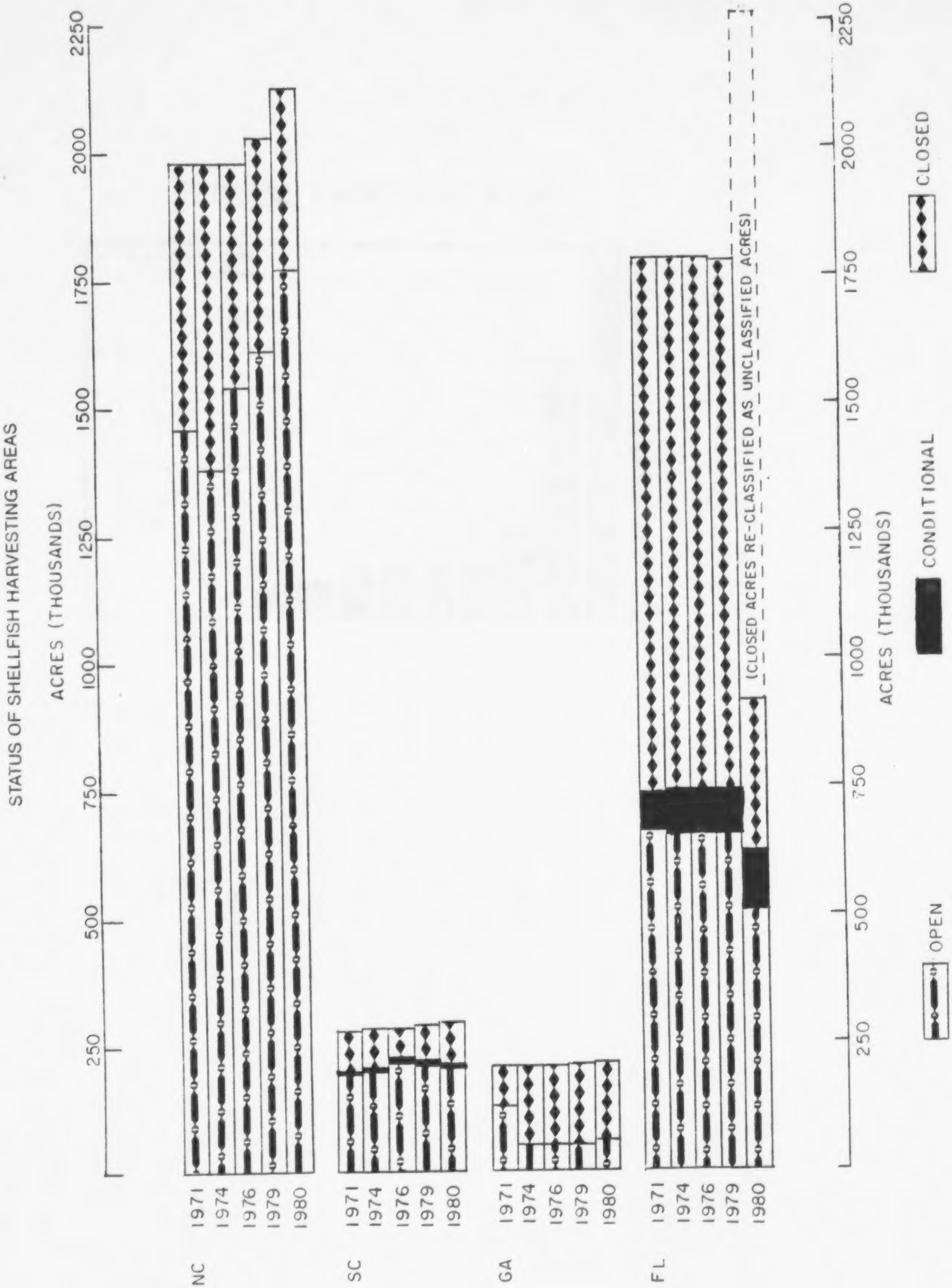

STATUS OF SHELLFISH HARVESTING AREAS
ACRES (THOUSANDS)
250
500
750
1000
1250
1500
1750
2000
2250
NC
SC
GA
FL
1971
1974
1976
1979
1980
(CLOSED ACRES RE-CLASSIFIED AS UNCLASSIFIED ACRES)
OPEN
CONDITIONAL
CLOSED

Figure WQ - 16

STATUS OF SHELLFISH HARVESTING AREAS

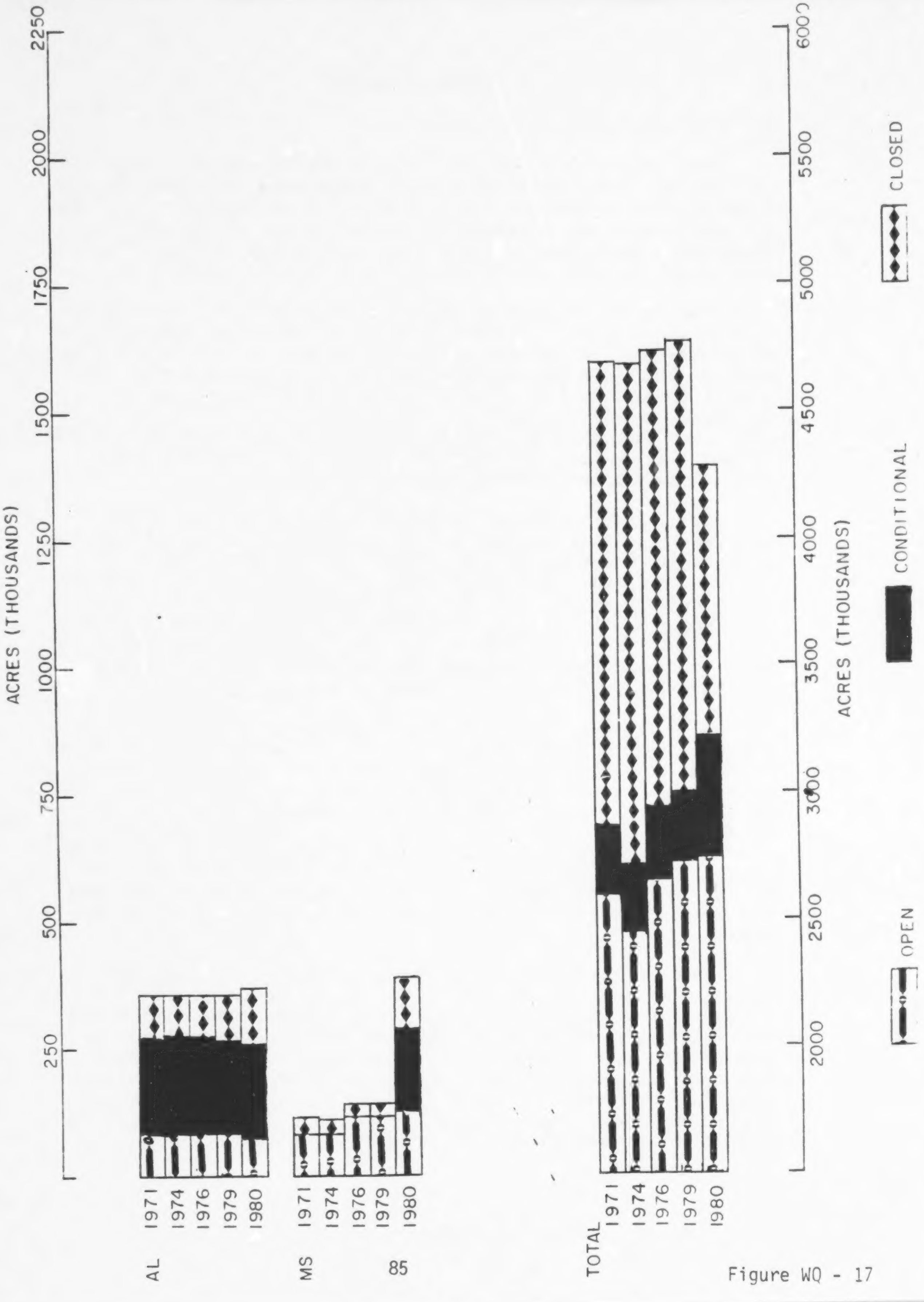


Figure WQ - 17

DRINKING WATER

1. Bacteriological Concerns

The compliance analyses of the FY 81 bacteriological contaminant data which have been completed for each of the eight states in Region IV, and FY 82 data which are available for the states of Kentucky, Florida, Mississippi and Tennessee, have been utilized to assess the bacteriological compliance record and identify significant trends.

The FY 81 Maximum Contamination Level (MCL) and Monitoring and Reporting (M/R) violation rates for community water systems in Region IV were 9.3% and 31.8% respectively, whereas the national average violation rates for MCL and M/R were 8.5% and 25.6%. The FY 81 Region IV data represent a decrease, however, from the FY 80 violation rates of 11.2% (MCL) and 38.2% (M/R). Regional comparisons appear to show a good correlation between the number of small and very small systems and violation rates.

During FY 81 three of the states had a significant decrease in their MCL violation rates, and seven states had a decrease in their M/R violation rates. Tennessee and Mississippi have decreased significantly their MCL and M/R rates during FY 82. Preliminary results indicate Florida's rates of violations for MCL and M/R have increased. Table DW-1 lists the FY 80 and 81 MCL and M/R violation rates for each state in Region IV and the FY 82 rates for the states for which information is presently available.

A majority of the water systems in Region IV use groundwater as their source. Of the 11,735 community water systems in Region IV, 10,176 utilize groundwater. The FY 81 violation rates for groundwater systems are 9.8% (MCL) and 32.3% (M/R). This compares with violation rates for surface systems of 6.5% (MCL) and 28.4% (M/R). This difference is likely attributable to the higher number (on a percentage basis) of very small systems that utilize groundwater as a source of potable water. As noted below, smaller systems are more probably violators of both MCL and M/R requirements.

The community water systems in Region IV have been categorized by system size into one of seven population groups. The largest number of MCL and M/R violations and the highest percentage of M/R violations occurred in the population group serving 100 people or less (Table DW-2). The high violations rates are indicative of the problems that states generally have in dealing with small systems where low operating budgets and least qualified operators result in higher violation frequencies.

Each of the states in Region IV is divided into regions or districts. For each district or region the percentage of systems with MCL and M/R violations has been calculated. Systems with an MCL violation rate greater than 20% or a M/R violation rate greater than 40% are presented in Table DW-3.

An analysis of the frequency and duration of M/R violations indicates that in Region IV persistent violators (systems with a minumum of four M/R violations) comprise 6.8% of the total number of community water systems, but account for greater than 50% of the M/R violations. Table DW-4 presents the number of persistent violators and a percentage of the total number of community water systems that are persistent violators in each state. Therefore, maximum effort in dealing with bacteriological violations will be directed toward persistent violators.

Based upon an analysis of the FY 81 and preliminary FY 82 data the following conclusions can be made:

- Region IV is experiencing a problem with bacteriological contamination in treated water in the states of Kentucky, Florida, Tennessee and Mississippi.
- The smallest systems have the highest percentage of systems with MCL and M/R violations.
- There are particular regions or districts that have high violation rates (when compared to national average rates) for MCL and M/R. These regions or districts are identified in Table DW-3.
- Regionally, a large number of violations are occurring in a small number of systems. Programs stressing persistent violators are being developed to alleviate this problem.

2. Turbidity

During FY 81 there were a total of 209 community water systems in Region IV that had turbidity M/R violations. Of these 209 systems, 157 systems were in Kentucky. All other states in Region IV had turbidity violation rates well below the national average rates of 4.9% for MCL and 14.2% for M/R. Kentucky's violation rate for M/R in FY 81 was 36%. However, based on FY 82 results, Kentucky had a total of 90 systems with violations out of 482 systems that monitor for turbidity. This represents a violation rate of 18.6%, a significant decline from FY 81.

3. Organics

a. Trihalomethanes (THMs)

There are 53 systems in Region IV serving greater than 75,000 people and eight of the systems are or were in violation of the 0.10 mg/l MCL for THMs. Four of the systems not in compliance are expected to be brought into compliance through minor adjustments in the treatment process. The remaining four cities of Jackson, Mississippi, Lexington, Kentucky, and Melbourne, Florida, and Charleston, South Carolina have contracted with consulting firms to investigate the problems and recommend methods for reducing THMs.

The states are implementing extensive monitoring programs to monitor the systems in the population range of 10,000-75,000, but little data are available at this time for any conclusions.

b. Other Organic Contaminants

In an EPA conducted sampling and analysis program for volatile organic compounds (VOCs) in finished water from 945 water supplies throughout the United States, Region IV had a total of 219 systems sampled (107 random and 112 non-random). Of the systems in Region IV sampled, 40 systems or 18% contained measurable levels of VOCs other than THMs.

The seven compounds that occurred most frequently in the samples analyzed during the survey are listed below along with their frequency of occurrence and the range of detected concentrations of each compound.

Volatile Organic Compounds	Frequency of Occurrences		Range of Detected
	Number	Percent	Concentration ug/1
Cis-and/or Trans-1,2-Dichloroethylene	13	5.9	0.23-15.0
Trichloroethylene	13	5.9	0.24-19.0
Tetrachloroethylene	10	4.6	0.21-12.0
1,1-Dichloroethylene	9	4.1	0.23-16.0
1,1-Dichloroethane	9	4.1	0.20-1.2
1,1,1-Trichloroethane	9	4.1	0.23-13.0
Carbon Tetrachloride	7	3.2	0.29-3.0

As a result of the study, Region IV has recommended the closing of ten wells, marginal use of eight wells, and additional monitoring for twelve wells. The location of each of these wells is indicated on a regional map designated as Figure DW-1.

With the increased incidence of drinking water contamination by organic chemicals, the Agency emphasis appears to be shifting away from biological water quality. It is important that the Agency not lose sight of the relative significance of the two types of contamination. While a number of the organic chemicals that have been found in drinking water are suspected or known animal and human carcinogens, their effect normally requires an extended period of exposure. Rarely has the concentration of any organic compound been present in a drinking water well at concentrations which would be acutely toxic.

On the other hand, only a small number of microbiological organisms are required to cause disease. The disease caused by ingested organisms is expressed within a few hours to weeks (depending upon the organism) of the exposure. Repeated, long term exposure is not necessary for biological agents to result in disease; therefore, it is important for the Agency to continue to work toward acceptable biological monitoring and MCL compliance for water supplies at the same time it works toward control of organic chemicals in drinking water.

4. Radiological and Inorganic Violations

There were approximately twenty systems in the Region in FY 81 and 82 which exceeded the maximum contaminant levels for the inorganic drinking water standards. These violations were spread throughout the Region, with fluoride being the contaminant most frequently exceeding the regulations.

There are five systems in Georgia and eight in North Carolina exceeding the radiological standards based upon FY 81 data. Most of these problems have been eliminated or are being corrected by finding new sources of water or adding additional treatment. The violations should be eliminated by the end of 1983.

5. Shortage Concerns

A major problem related to quantity of available and suitable water for drinking has begun to emerge in the Southeast. As population and industrial growth continue, the adequacy of water supplies to meet the resulting demands becomes an increasingly important issue. As contamination problems become more widespread, the available water supply, which is already under pressure from a shortage standpoint, will be further reduced.

Because of the expansion of pollution control efforts, especially in the 1970's, many surface sources of potable water have improved (or not deteriorated further). However, quality of groundwater has, in many isolated cases, deteriorated, since many of these pollution control efforts did not address groundwater contamination. As the expansion of various uses of water occurs, problems will increase. Considerable effort will be required to balance economic growth and protection of water resources in the future.

6. Conclusions

1. Regional bacteriological MCL and M/R violation rates are in excess of the national average. The high rate, however, may be attributed to the large number of small community water systems in the Region.
2. The small systems and groundwater systems are experiencing the highest MCL and M/R violation rates. Since smaller systems generally use groundwater, the high violation rates for groundwater may be the result of unqualified operating personnel and low budgets.
3. There are districts in Kentucky, Florida, and Georgia that have high bacteriological violation rates in treated water when compared to the national average.
4. Persistent violators are responsible for a large number of bacteriological violations when compared to the national average.
5. Kentucky has a high turbidity M/R violation rate, however, the other states in the region have a violation rate lower than the national average.
6. Radiological violations have occurred in several states but are generally not widespread. Where they are persistent, alternative sources are being used or will be available by the end of 1983.
7. Isolated instances of shortage problems have been and are occurring particularly along coastal areas of the Region. It is expected that as the expansion of various uses of water occurs, problems with quantity of water available for potable water supplies will increase.
8. The National Groundwater Survey (NGWS) has identified high levels of organic contaminants in south and central Florida.
9. The inorganic violation rate is low and violations are scattered throughout the Region.

Table DW-1

Compliance Comparison For Microbiological Violations

State	MCL% FY 80	MCL% FY 81	MCL% FY 82	M/R% FY 80	M/R% FY 81	M/R% FY 82
AL	10.6	6.7	N/A	7.8	5.3	N/A
FL	6.1	7.8	14.1	57.4	47.5	53.7
GA	14.3	6.0	N/A	38.4	35.5	N/A
KY	12.6	15.0	11.9	68.1	58.1	48.9
MS	17.1	17.9	14.2	35.3	29.7	23.6
NC	15.8	9.9	N/A	35.0	19.7	N/A
SC	6.6	5.0	N/A	18.3	16.4	N/A
TN	0.0*	7.1	4.9	11.5	47.3	30.2
Total	11.2	9.3		38.2	31.8	

N/A - Not Available

* - Complete Data Not Available

Table DW-1

Compliance Comparison For Microbiological Violations

	MCL%			M/R%		
State	FY 80	FY 81	FY 82	FY 80	FY 81	FY 82
AL	10.6	6.7	N/A	7.8	5.3	N/A
FL	6.1	7.8	14.1	57.4	47.5	53.7
GA	14.3	6.0	N/A	38.4	35.5	N/A
KY	12.6	15.0	11.9	68.1	58.1	48.9
MS	17.1	17.9	14.2	35.3	29.7	23.6
NC	15.8	9.9	N/A	35.0	19.7	N/A
SC	6.6	5.0	N/A	18.3	16.4	N/A
TN	0.0*	7.1	4.9	11.5	47.3	30.2
Total	11.2	9.3		38.2	31.8	

N/A - Not Available

* - Complete Data Not Available

Table DW-2

Microbiological Violations By System Size

FY 81 Data

Size Category	Number of systems	Systems with MCL Violations	Systems with M/R Violations	Percent Systems with MCL Violations	Percent Systems M/R
100	4091	406	1582	9.9	38.7
101-500	3402	296	1045	8.7	30.7
501-2,500	2511	272	580	10.8	23.1
2,501-5,000	731	66	270	9.0	36.9
5,001-10,000	453	29	131	6.4	28.9
10001-75,000	448	24	107	5.6	24.1
75,000 and up	99	0	14	0	14.1
Total	11735	1093	3729	9.3	31.8

Table DW-3

Districts or Regions with a Greater than 20% MCL or 40% M/R Violation Rate

State	District or Region	M/R Violation Rate	MCL Violation Rate
**Florida	Pensacola	65.5	23.8
	Jacksonville	57.7	
	Orlando	55.5	
	Tampa	57.6	
*Georgia	Middle (Macon)	40.7	
	Southeast (Brunswick)	40.7	
**Kentucky	1 (Paducah)	43.6	
	2 (Madisonville)	48.9	
	5 (Florence)	58.0	
	7 (Columbia)	46.2	
	8 (Morehead)	61.8	
	9 (London)	53.5	
	10 (Hazard)	71.2	

* - FY 81 Data

** - FY 82 Data

Table DW-4

Community Water Systems With A Minimum of 4 M/R Violations

State	CWS with a Minimum of 4M/R Viol.	Number of Violations	Percent of Total CWS
Alabama	6	37	0.9
Florida	389	2889	25.2
Georgia	96	653	6.5
*Kentucky	107	930	15.1
*Mississippi	74	565	5.3
N. Carolina	25	164	0.9
S. Carolina	16	131	1.3
*Tennessee	88	827	12.1
	801	6196	6.8

* FY 82 Data

GROUNDWATER

1. Groundwater Use and Aquifer Systems

Groundwater is one of the Southeast's most important resources. The use of groundwater increased by 160 percent between 1960 and 1980. The USGS estimated that groundwater met 41 percent of the Region's freshwater consumptive use need in 1980. Overall, Florida, Mississippi, and Georgia are the most dependent on groundwater. Rural users in North Carolina, Florida, and Georgia are almost totally dependent on groundwater as a water supply source. In 1970, almost 70 percent of the population in the Southeast obtained its drinking water from groundwater sources.

Southeast aquifer systems can be grouped into five Groundwater Provinces based on differences in hydrology: Central Plateau; Valley and Ridge; Piedmont and Blue Ridge; Atlantic and Gulf Coastal Plain; and the Floridan. (Figure GW-1)

The Central Plateau of Kentucky contains several broad regional (multi-county) aquifers which are composed of essentially horizontal carbonate rocks and regolith deposits. Groundwater occurs primarily in solution-enlarged bedding planes and to a lesser extent in enlarged joints and faults. The extensive karst areas within the province are the most vulnerable to groundwater contamination because of direct conduits provided by sinkholes and sinking streams.

In contrast to the broad regional aquifers of the Central Plateau, the localized aquifers of the Valley and Ridge Groundwater Province are limited by the folded and faulted geologic structure of the province. Like the Central Plateau, karst areas in the Valley and Ridge Province are abundant, and groundwater flow is generally fracture controlled in the sandstones, shales and limestones of the province.

In the Piedmont and Blue Ridge Province, fractures comprise the major storage transport network in the igneous and metamorphic rocks and associated saprolites. Unlike the sedimentary rocks in the other four provinces, no distinct aquifers can be delineated in the crystalline rock of the Piedmont and Blue Ridge.

Numerous layers of consolidated and unconsolidated sedimentary rocks form the region aquifer systems in the Atlantic and Gulf Coastal Plain Groundwater Province. Beginning as a thin wedge overlying the consolidated rocks of the northern provinces, the unconsolidated clay, sand, gravel, and consolidated and semiconsolidated limestones thicken and dip seaward in the east and south or toward the Mississippi River in the west.

Though very similar to the Atlantic and Gulf Coastal Plain, the hydrogeology of the Floridan Groundwater Province is distinguished by the Floridan Aquifer, a highly productive and extensive carbonate rock formation. The Floridan is the major water supply aquifer in Florida and large parts of the Coastal Plain of Georiga. The aquifers in the sedimentary rocks overlying the Floridan are of the same lithologic type aquifer systems serving as the principal sources of potable water in Southeast Florida (the Biscayne Aquifer) and in coastal areas where the Floridan yields brackish water. As in the Central Plateau and Valley and Ridge Provinces, the Floridan contains karst areas, principally on the Ocala uplift and in Central Florida.

Throughout the Southeast, alluvial deposits and associated rivers and streams form localized, surficial aquifers utilized for domestic water supplies.

2. Groundwater Problems

Serious groundwater degradation problems tend to be highly localized. However, in parts of the Atlantic and Gulf Coastal Plains and most of Florida the problems are more pervasive. The full extent of groundwater quality problems is not well known due to inadequate data management. Problems originate from lack of coordination and information exchange between and within agencies involved. Inadequate technical and financial support for well networks and sampling, inconsistent or conflicting terminology associated with aquifer zones, and under-utilization of existing data bases are further examples of these problems. (SPDD, 1982, Section 5.5) Development of the needed comprehensive data storage, analysis and retrieval programs could be accomplished with a relatively small amount of resources. Most, if not all, of the states in the Region are struggling with the problem of data management.

Perhaps the major reason we know so little about groundwater pollution problems is because no serious attempt has been made at the regional or national level to identify and track such problems. Such an information base can and should be established. However, many obstacles and questions would have to be resolved before implementation could occur. As a start, groundwater problems have been categorized by pollution source for this report. Because pollution sources are numerous, problems are widespread, and specific data are limited, groundwater problems and concerns relative to each pollution source are discussed below in general terms.

a. Surface Impoundments

In 1978, EPA undertook a nationwide study to determine the potential effect of surface impoundments on groundwater. At that time, little data were available on the number, location, or construction of surface impoundments, and their potential for groundwater contamination was unknown. The Surface Impoundment Assessment (SIA) was primarily a desk-top study although some states did field verification of the results. Five major categories of impoundments were used; (1) industrial, (2) municipal, (3) agricultural, (4) mining, and (5) oil and gas. The potential effect of the surface impoundments was then assessed by using a numerical rating scheme which took into account hydrogeologic setting, waste type, construction features, groundwater quality, and availability of monitoring data. As part of the state SIA report, state teams submitted representative case studies and provided descriptions of state regulatory authorities and programs pertaining to surface impoundments.

The eight State reports for Region IV were reviewed by Groundwater Section Staff and form the basis of a regional SIA report now in preparation. Although content and type of information varied from report to report, certain general conclusions can be drawn:

(1) Case histories show that groundwater contamination is occurring in all categories of impoundments and in all geologic settings.

(2) The assessment results indicate that two-thirds of the surface impoundments in the Region have a high potential for contamination of groundwater beneath the sites.

(3) The potential for groundwater contamination by unlined surface impoundments is primarily controlled by geology of the site; type of waste in the impoundment is a secondary controlling factor.

(4) Regardless of the site geology or type of waste, the number of lined impoundments is small (< 3%).

(5) With the exception of those impoundments now subject to RCRA Subtitle C standards, federal regulations and programs do not adequately address surface impoundments. At this time, about half the states in Region IV have permitting procedures for surface impoundments (excluding RCRA facilities) which take groundwater contamination into account.

b. Landfills

Over the years, EPA Region IV has received numerous calls and letters from citizens alledging contamination of their wells by nearby landfills. These complaints were (and still are) routinely referred to the states. State agency response to such complaints varies from state to state. State agencies are understandably reluctant to test water samples every time a complaint of well contamination is received because of the cost. In those instances where well samples have been collected and analyzed by the states, the testing is typically limited to inorganic constituents (i.e. PDWS's). There is at least one case involving a Superfund site in which limited testing for inorganics failed to indicate water supply contamination. Upon further testing by EPA, several samples from wells near the site were found to be contaminated by organics.

Although the contamination problem mentioned above is not typical of the type or degree of contamination one would expect from a landfill, the potential for such incidents is probably greater than generally believed. This conclusion is based on two observations. First, serious efforts to curtail disposal of industrial waste in municipal landfills have only occurred in the past five years; many currently operating landfills are older than 5 years and many will continue to receive hazardous waste from small generators. Second, the majority of landfills currently operating do not have monitoring systems, and that monitoring which has been done has focused almost exclusively on inorganic parameters.

c. Uncontrolled Sites

Superfund is intended to address health and environmental threats associated with past incidents of uncontrolled dumping of hazardous waste. In this Region, numerous cases of groundwater contamination are attributable to such incidents. Many of these have been listed as priority hazardous waste sites. The public and EPA must recognize that because of the large number of potential problem sites in this Region and nationwide and the high costs associated with assessment of groundwater contamination and aquifer restoration, only the most acute problems can be rectified. However, decision makers in the Superfund program must resist the temptation to downplay the potential health risks associated with trace levels of toxic organics in drinking water and limit remedial action on groundwater pollution problems to consideration of existing primary drinking water standards.

d. RCRA Land Disposal Facilities

Approximately 325 RCRA facilities (landfills, surface impoundments, land application sites) in the Region monitor groundwater in accordance with interim status standards. Six of these facilities appear on the Superfund list because of documented contamination. Some of these sites have both abandoned and active disposal units, and it may not be clear which particular units have caused contamination. Part B applications are being called in on these six facilities on a priority basis. Additional RCRA facilities are probably contaminating groundwater, but these sites will not be identified until June 1983, or later, when the results of the first round of semi-annual monitoring under interim status have been compared to background data collected the previous year. Additional time will be required to assess the extent and severity of groundwater contamination at sites where problems are indicated.

e. Septic Tanks

Septic tanks are common in Region IV, and their number is expected to increase in the future with the influx of population to the "Sunbelt" states. The groundwater contamination threat is directly related to the density of septic tanks allowed in a given area. The most common density of septic tanks in the Southeast is one per acre, but densities may range upwards to four per acre. For instance, in the Ft. Morgan Penninsula on the Alabama coast, beach houses are constructed on 1/4 acre lots. Each house has a septic tank and a private well for drinking water. Widespread groundwater contamination by pathogenic organisms and nitrates have prompted county health officials to order a ban on well-water use.

Nitrates and pathogens are the most common groundwater contaminants from septic tanks. More recently, the use of solvents, such as TCE, as septic tank cleaners has raised concern of contamination by synthetic organic chemicals. Often, the overall effect of septic tanks is low level degradation of groundwater over a wide area.

Little data exist in the Region on groundwater contamination by septic tanks. The septic tank regulations of the states and/or counties are often inadequate or poorly enforced. For instance, the State of Tennessee allows blasting to provide space for septic tank drain fields in rock. Some states, however, such as North Carolina have developed new site-specific guidelines for septic tank construction.

f. Injection Wells

Groundwater contamination problems involving injection wells are not as widespread and severe, at present, as other problems in Region IV. Two major types of injection wells cause problems in Region IV. Improperly constructed or mechanically defective Class II saltwater disposal wells are causing groundwater contamination in oil producing areas, as described in the section on oil and gas development below. Class V drainage wells have caused many localized contamination problems in Florida and Kentucky.

In Florida, over 3000 drainage wells have been permitted to receive stormwater and street runoff or to be used for surface water/lake level control. Since the water moves relatively rapidly through the karstic aquifers (rates of feet per minute in some cases), little or no in-aquifer attenuation of any contaminants present in the storm water or lakewater occurs. Problems with bacterial contamination are documented in the literature for Orange County and Suwannee County, Florida. In Kentucky, drainage wells are used extensively in the extremely well developed karstic limestone in the Bowling Green area. Drainage wells terminating in cave systems are used for storm water drainage and in some cases, the disposal of raw sewage and other waste.

Minor problems may exist with Class I wells constructed before the implementatin of the UIC program, but permit review is expected to find those wells which do not meet current contruction standards. It should be noted that three States have banned or are expected to ban Class I wells. Also, Alabama will not permit any new Class I wells.

g. Land Application

Land application of wastewater and/or sewage sludge has been encouraged principally because of the costs associated with the increased level of treatment necessary to meet surface water quality standards. The construction grants program offered additional financial incentive to communities considering land treatment systems. As of 1981, approximately 90 publicly owned land treatment systems were in operation or under construction in Region IV with more than 30 in Florida. Probably many more industrial and privately owned land treatment systems are in operation. Florida alone has over 2500 permitted sites for land disposal of domestic wastewater. Not much is known about this impact on groundwater quality. Only a few of the sites in Florida are monitored on a regular basis, and the same is probably true of sites in other states.

h. Spills and Leaks

Spills and leaks rank as the most common contamination source requiring well replacement with the most frequent pollutants being hydrocarbon products. Contamination of groundwater can occur from leaky and ruptured pipelines and storage tanks, transportion accidents, and "poor housekeeping" practices by industry, airports, service stations and farms. Recently, incidents involving contamination of water supplies in two states came to our attention. In Belleview, Florida, a minimum of 10,000 gallons of gasoline leaked into the city's well field causing the city to seek alternative water sources. In Stuart, Florida, at least four private wells have been contaminated by gasoline. Both incidents have been attributed to leaking storage tanks at service stations. In Perdido, Alabama, benzene has contaminated a number of private wells. The source of the contamination is thought to be a 1965 train derailment in which benzene and other chemical were spilled. In most cases, spills or leaks are discovered after they have already polluted water supplies. While little can be done to control releases caused by accidents, steps can and should be taken to reduce the incidents of spills and leaks from pipelines and buried storage tanks. Possibly, pressure testing of underground storage tanks and lines should be required within specified time periods.

i. Oil and Gas Development

Groundwater contamination caused by oil and gas activities is one of Region IV's greatest concerns. Problems are mostly due to lax enforcement of state or federal regulatory requirements in problem areas. The most common contaminant associated with petroleum production is the concentrated salt brine which naturally occurs with the oil in the rock formation and is brought to the surface when oil is produced. These brines are extremely concentrated with total dissolved solids content often many times that of sea water. Generally, newer oil fields produce very little brine, but as the oil is removed from underground reservoirs, increasing amounts of saline water move in and are extracted with the oil. In stripper wells, which produce less than 10 barrels of oil per day, ratios of 10 barrels of saltwater to 1 barrel of oil are not uncommon. Other problems may arise when the well is improperly constructed or improperly abandoned allowing movement of the often pressured brine along the well bore into fresh water aquifers. Minor contamination problems have also occurred in Kentucky where natural gas has leaked and contaminated private wells.

Kentucky and Mississippi suffer from widespread and locally severe problems due to brine contamination. For instance, in Magoffin County, Kentucky, the governor declared a state of emergency last year when both surface water and groundwater supplies became heavily contaminated with salt. In Mississippi, data released by the USGS in 1982 show shallow groundwater contamination and/or surface water contamination by brine in every oil producing area studied. EPA has been informed of at least two public water systems relying on groundwater and numerous private wells which have been contaminated by brine in Mississippi. Another state, Florida, has documented problems with improperly plugged and abandoned oil test wells, many drilled in the 1920's and 1930's. Some of these wells have become "wild flowing wells" with pressured salt water moving up from deeper formations and causing contamination of surface and groundwater. Eastern Kentucky may have similar problems; oil exploration began around the turn of the century and records of well location and abandonment procedures are far from complete. A major problem with brine contamination is its longevity; problems possibly caused by brine improperly disposed of decades ago are only now reaching private wells.

There are four ways by which groundwater contamination by brines is or may be occurring in Region IV. The first and most common is the use of earthen pits or "evaporation ponds" for brine disposal. Earthen pits for brine disposal are banned in every state except Kentucky where brine is disposed of to either earthen pits or to surface water. Another major problem is the use of improperly constructed and operated injection wells. Mechanical integrity testing mandated by the UIC program will help with this problem; however, there are, at present, wells of adequate construction in Mississippi which are designed to inject saltwater brines into freshwater aquifers. A third widespread problem is that of illegal disposal. Inadequate enforcement in Mississippi allows the use of some illegal pits to continue. The fourth problem area is that of inadequate production well casing and cementing requirements. Some states require only a minimal amount of surface casing and cement allowing groundwater of differing quality to migrate along the well bore.

j. Groundwater Development

There are two major types of problems associated with groundwater development. The first concern the quantity of groundwater available. Increased demand may cause an area to run out of good quality water and to resort to a supply of lesser quality or greater expense. Overpumping may cause physical problems such as land subsidence and sinkhole collapse. Quantity problems are common in Region IV and many states have permitting programs to control water usage. The second type of problem associated with groundwater development involves quality changes in water. Overpumping can decrease artesian pressure in an aquifer from an adjacent body of saltwater or upconing, where saline waters from underlying aquifers are pulled up into fresh water. The problem is a serious one and almost irreversible. If groundwater withdrawal exceeds the safe yield, and water levels decline, for every foot of decline in the fresh water table, salt water rises 40 feet.

Every coastal state in Region IV has documented problems with saltwater intrusion and the literature describes problems with upconing in most. An added problem caused by overpumping has been the lowering of artesian water levels on offshore islands threatening wildlife dependent upon naturally occurring freshwater springs.

Barrier islands and coastal beaches are particularly susceptible to salt water intrusion brought on by overpumping. These aquifers usually consist of shallow lenses of fresh water floating on top of deeper salt water replenished by rainfall. The Southern beaches and peninsula of Pinellas County, Florida, for instance, contaminated their shallow aquifer decades ago by overpumping and associated saltwater intrusion, and they now must obtain water from counties further inland. The barrier islands of North Carolina, Sanibel Island, Florida, and the Florida Keys are documented as having problems ranging from moderate to severe. It would be safe to assume that every developed coastal beach or barrier island in Region IV is affected to some degree by saltwater intrusion.

k. Energy and Mineral Mining

Mining activities in Region IV that have the greatest potential to impact groundwater are coal and phosphate. Coal is mined principally in Kentucky, Alabama and Tennessee, and phosphate is mined predominantly in Florida, North Carolina and Tennessee. Mining impacts groundwater by altering the land surface which may, in turn, alter aquifer recharge characteristics. Disturbance of the subsurface increases the dissolved solids content of groundwater and alters the natural geochemistry of the system by exposing previously unexposed minerals. Dewatering lowers water levels in adjacent areas commonly affecting private drinking water supply wells. Finally, leachate from waste stacks and spoils stockpiles may contaminate the groundwater system.

Coal mined from the surface is regulated under the Federal Surface Mining Control and Reclamation Act (SMCRA) which requires an assessment of the project's impact on the hydrologic resources as well as groundwater monitoring. This helps to reduce this activity's impact on groundwater resources. However, coal mined below the surface and phosphate mining are not regulated by the SMCRA and therefore pose a more direct threat to groundwater resources. Phosphate waste stacks are known to contaminate the shallow groundwater system. Shallow groundwater pumped into the deeper Floridan Aquifer as part of the dewatering process has elevated levels of radium in localized areas of the Floridan Aquifer as well. Dewatering activities in the phosphate mines in Florida as well as the coal mines in Kentucky have dropped water levels in adjacent private wells to the point that the wells are no longer useful.

1. Agricultural Activities

Contamination of groundwater can occur from a number of activities associated with crop production, dairy farming and livestock management. Introduction of chemicals at the surface which eventually migrate to the water table and the accumulation of salts in groundwater due to irrigation practices are the principal causes. In a sampling of water well drillers, contamination of wells by pesticides, fertilizers and feedlots accounted for 10 percent of the cases of groundwater contamination requiring well replacement. Water table aquifers beneath the Coastal Plain of North Carolina, South Carolina, Georgia, Florida and Alabama were found to be particulary susceptable to nitrate and pesticide contamination (Miller, et al, 1977).

The pesticide - groundwater contamination studies cited in the Miller report focus on environmentally persistent pesticides such as DDT and dieldrin. Many of the pesticides on the market today are easily degraded in the environment and are therefore thought to be less of a threat to groundwater. However, recent incidents such as the discovery of aldecarb (Temik) in groundwater beneath citrus groves in central Florida, and ethlene dibromide in an irrigation well in south Georgia may indicate a need for tighter control over the use of these and other pesticides where certain hydrogeologic conditions (i.e. sandy soils, low pH, and shallow aquifers) exist.

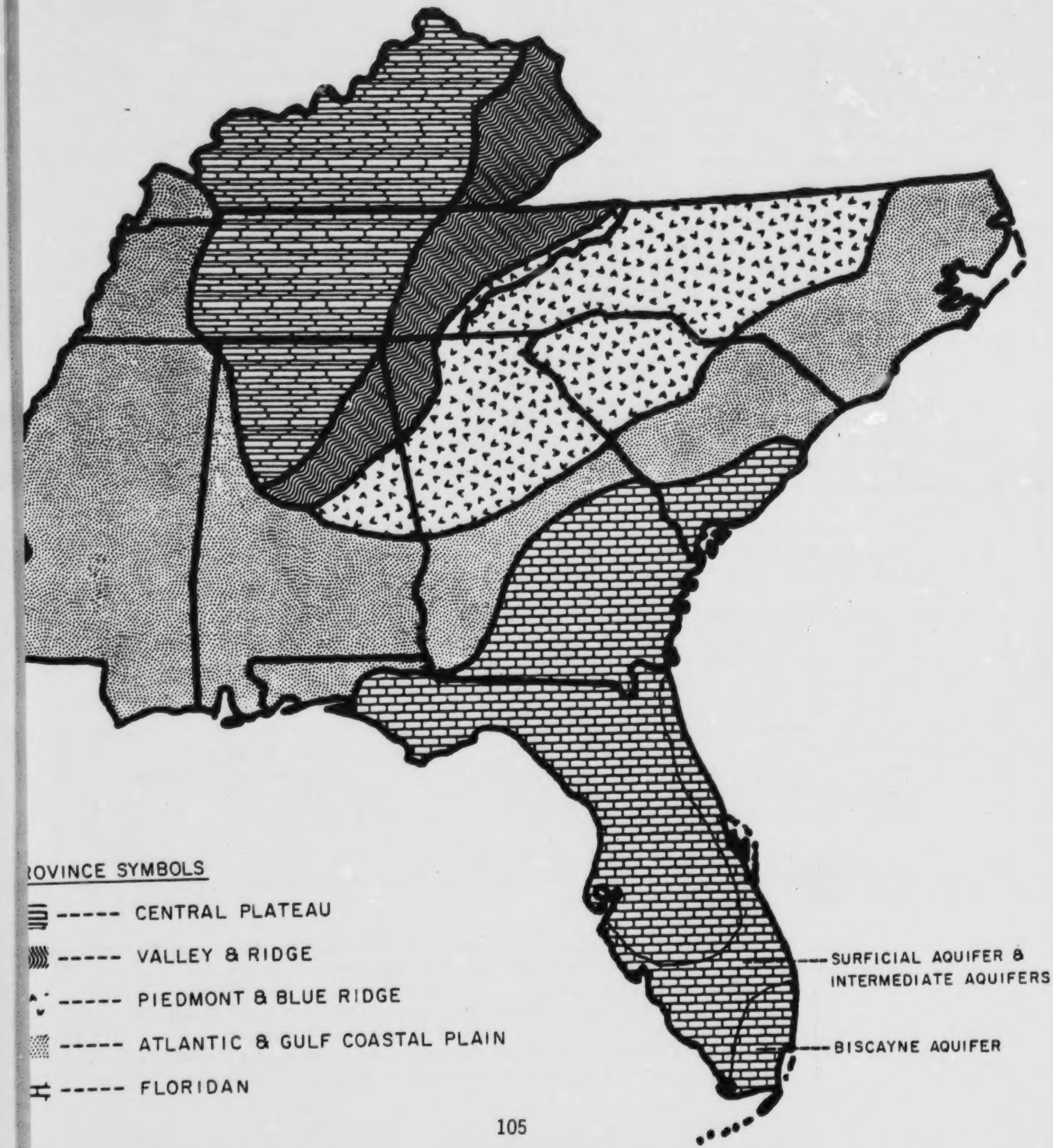
Farming operations are not the only source of nitrate and pesticide contamination of groundwater. The heavy use of fertilizers and pesticides by homeowners and pest control companies in urbanized areas may have an important impact on groundwater quality, especially in rapidly growing areas along the Atlantic and Gulf Coast which are dependent on shallow aquifers for drinking water supplies.

References

Science and Public Policy Program (SPPP), University of Oklahoma, 1982. "Groundwater Management Issues in the Southeast," draft report. Norman, Oklahoma.

Miller, D. P. Hackenberry, and F. Deluca, 1977. "Groundwater Problems in the Southeastern United States." EPA 600/3-77-012, U.S. Environmental Protection Agency, Washington, D.C.

REGION IV
GROUNDWATER PROVINCES*


ROVINCE SYMBOLS
----- CENTRAL PLATEAU
----- VALLEY & RIDGE
----- PIEDMONT & BLUE RIDGE
----- ATLANTIC & GULF COASTAL PLAIN
----- FLORIDAN
SURFICIAL AQUIFER & INTERMEDIATE AQUIFERS
BISCAYNE AQUIFER

ODIFIED FROM HEATH (1982)

Figure GW - 1

WETLANDS

1. Wetland Losses through Dredge and Fill Activities

Figures W-1 and W-2, respectively, show the losses by dredging and filling saltwater wetlands and freshwater wetlands from 1955-1975. Prior to the passage of Section 404 of the Clean Water Act in 1972, the only Federal saltwater wetland protection legislation in the coastal states was Section 10 of the 1899 River and Harbor Act. That jurisdiction extended shoreward to the mean high tide line. However, in many coastal areas much of the wetland was shoreward of this jurisdiction line. Typically developers would fill all of the wetlands they owned that were above the mean high tide line and then would apply for Section 10 permits to fill the more deeply flooded marsh and open water. There was no protection for freshwater wetlands. In March 1975, the Corps' regulatory authority was expanded to include all waters of the U.S., including wetlands.

In July 1975, the Corps issued regulations that required individual permit activities in saltwater wetlands above mean high water and freshwater wetlands adjacent to navigable streams. During 1976 and 1977, the requirement for individual permits was expanded to include wetlands upstream to the point where the stream flow is 5 cfs or greater.

The average annual loss of wetlands from 1955 to 1975 was approximately 450,000 acres. Figure W-3 shows the freshwater and saltwater acreages for 1975.

Although no formal record-keeping procedures are in effect, the results of a questionnaire sent to all the Corps Districts in Region IV suggest that dredging and filling destroys approximately 2,500 acres of saltwater and freshwater wetlands each year in Region IV. The State and Federal agencies know from experience that the rate of saltwater wetland loss due to dredging and filling was greatly curtailed after the implementation of the 1975 Corps regulations; however, these same regulations have not greatly reduced the rate of freshwater wetland loss.

The following needed improvements in the Corps' program were ascertained from discussion with Corps personnel and with other Federal agencies:

- o No program exists to quantify the wetlands authorized to be dredged or filled by issued permits. Issued permits usually do not contain acreage figures. Any information regarding wetland losses can usually be found only in the individual project files. Annual reports documenting cumulative impacts are not prepared. Reports documenting the trend in the overall condition of wetlands in any geographic area are not prepared. Apparently, neither the Corps nor the Assistant Secretary of the Army for Civil Works requires reports that document the effectiveness of the program.

- No program exists to quantify the wetlands dredged or filled as a result of violation of issued permits. A recent study by the National Marine Fisheries Service indicated violation of 64% of the permits issued by the Mobile District. Some Corps Districts had no permit violations.
- No program exists to quantify the wetlands lost to drainage and/or permanent flooding as a result of issued permits. Often this wetland destruction cannot be accomplished unless there is an issued Section 10 and/or 404 permit.
- No program exists to quantify the wetlands dredged or filled as a result of violation of Section 10 of the 1899 River and Harbor Act or filled as a result of violation of Section 301 of the Clean Water Act (failure to obtain Section 10 and 404 permits). The federal and state review agencies have observed that often more wetlands are lost to violation than to permitted activities. Data submitted by the Charleston Corps district for 1981 and 1982 show that only 16 acres of wetlands were lost due to permitted dredge and fill activities; however, a violation that had destroyed 400 acres of wetlands was discovered in January 1983. In 1980, one violation in Mississippi resulted in the destruction of 4,000 acres of wetlands.
- No program exists to quantify the wetlands lost during construction of Federal projects. Many acres of wetlands are impacted each year by disposal of dredged material, dredging, impoundment flooding and drainage projects. Additionally, many acres of wetlands are impacted due to loss of periodic flooding below flood control structures. Some of these projects have met 404(r) exemption and do not need Section 404 permits.
- No program exists to quantify the wetlands lost due to general permits.
- Corps' records regarding permit activities are for District boundaries. Unless a District boundary coincides with a state boundary, data for an individual state are not obtainable.

In order to determine accurate trends for the loss of wetlands in this nation, it will be necessary for the Corps to initiate programs to correct the referenced deficiencies. We recommend that the Agency notify the Assistant Secretary of the Army of the deficiencies in the Corps' program.

2. Dredge and Fill Problem Areas

North Carolina (Coastal)

Problem - Loss of the pollution abatement provided by wetlands. The primary problems are wetland removal for conversion to agriculture, drainage to improve the production of pine timber and stream channelization. As a result of this wetland degradation, water quality in the North Carolina estuaries continues to decline.

Solution - Due to the expanded nationwide permitting provided by current Corps regulations, these problems are difficult to solve. The nationwide permit for all isolated wetlands should be rescinded.

Problem - Phosphate mining in wetlands.

Solution - If it can be demonstrated that restoration of mined wetlands can be accomblished, perhaps mining in the wetlands and open water can be allowed. Transfer of phosphate nutrients to estuarine waters during the mining operation is expected to be a continuing problem.

Problem - Discharge of freshwater into the estuaries is altering the salinity balance. This problem is primarily caused by the large-scale clearing of wetlands to gain more agriculture land.

Solution - This problem has been studied for a number of years. No one has proposed any solution acceptable to all involved parties.

North Carolina (Mountains)

Problem - Increasing pressure by the State Transportation Agency to construct highways in stream beds and adjacent wetlands. Many streams are becoming riprapped corridors.

The selection of ocean disposal sites in Region IV should be accomplished by Region IV personnel. Region IV should also have complete authority for all environmental studies and the issuance of all ocean dumping permits. The total transfer of these responsibilities to the Regions would greatly improve the efficiency of the program. The Washington Office should be concerned with overall national policy.

Specific Problems by state are:

North Carolina

Problem - Inadequate disposal areas for 102 million cubic yards per year (mcyy) in the Sunny Point Terminal area.

Solution - The solutions from an environmental standpoint in preferred order are: (1) upland disposal with recycling, (2) diked upland disposal and (3) ocean disposal. The Corps has resisted ocean disposal as a solution because of high costs and the lack of a program to develop adequate equipment.

South Carolina

Problem - Upland disposal areas are in short supply. Thousands of acres of wetlands have already been destroyed and it is unlikely that any additional areas will be made available to the Corps. At present 12 mcyy are dredged and disposed of in diked areas.

Solution - The Corps' implementation of the Cooper River Rediverson project should reduce dredging and disposal to 3-4 mcyy. This material could possibly be disposed of in the ocean.

Georgia

Problem - Dredging of the Savannah Harbor generates approximately 7 mcyy of material which is disposed of in diked disposal areas along the river. Thousands of acres of wetlands have been destroyed. A boundary dispute with South Carolina was also involved.

Solution - Same as comments for North Carolina.

Problem - Acceptable disposal areas for the dredged material from the intermediate channel at Brunswick are difficult to obtain.

Solution - Possible disposal in the ocean.

Florida

Problem - Recent improvements in the dredged spoil disposal areas in the upper reaches of Tampa Harbor should provide disposal capacity for 20-50 years. These disposal areas cannot be expanded without further disruption of circulation and adverse impacts on water quality. Locating an adequate disposal area in the Gulf for the material dredged from the lower channel is a problem.

Solution - The long-term solution is disposal at an acceptable site in the Gulf.

Problem - The Corps has disposed of dredged spoil material in Apalachicola Bay for many years. There is concern that this disposal practice has disrupted circulation and adversely impacted biological productivity.

Solution - Existing spoil banks should be broken to reestablish circulation. Much of the future maintenance material should be disposed of at upland sites or in the Gulf.

Alabama

Problem - Only one year's capacity remains in the dredged spoil disposal area in Mobile Harbor. Thousands of acres of shallow-water habitat and marshes have been destroyed by past disposal. The Corps has requested permission to use 385 acres of additional wetlands for spoil disposal as an interim solution. This plan is being resisted by the review agencies.

Solution - A satisfactory solution appears to be disposal in the Gulf.

Mississippi

Problem - Acceptable spoil sites in Mississippi Sound for the navigation channels to Pascagoula and Biloxi are in the planning stages.

Solution - None known.

South Carolina (Coastal)

Problem - Marina development in productive shellfish areas. Closure of oyster and clam beds due to contamination by fecal coliform bacteria from boats concentrated at marinas. Destruction of oyster beds by wakes from recreational boating near marinas.

Solution - Additional studies are underway to evaluate the extent of these problems. When the problems cannot be reduced to an acceptable level, the Section 10/404 permits should be denied.

Problem - Conversion of bottomland hardwood swamp to agricultural land has just begun.

Solution - Can be handled through the permit review process if the Corps required individual permit applications. Based on past experience in North Carolina, the Corps will likely determine that over 50% of the wetlands are covered under Secion 404 nationwide permits.

Problem - In many small streams the total stream flow is used for irrigation.

Solution - None; irrigation canals are exempt from 404 jurisdiction provided the spoil from the ditch is not placed in continuous piles that block water flow.

Problem - Conversion of wetlands for duck impoundments.

Solution - Permit denial. We need support from the Administrator and the Office of Federal Activities.

Georgia (Coastal Plain)

Problem - Drainage of swamps for conversion to pine plantations. Much of this activity is unauthorized. Large acreages of swamps are involved.

Solution - The Savannah Corps District must institute a surveillance program and vigorously enforce Section 404. While some areas require individual permits, problems can be handled through a vigorously applied permit review process. EPA can request the Corps to exert discretionary authority over especially valuable wetlands now covered under nationwide permits; however, the Corps does not always agree to this.

Florida

Problem - Large numbers of applications for fill material in saltwater and freshwater wetlands.

Solution - Need more staff and more travel money so all permit applications can be adequately reviewed. This would provide opportunities for better coordination with federal, state, and local officials.

Problem - Large number of unauthorized fills in saltwater and freshwater wetlands.

Solution - Increased surveillance by Corps personnel. Elimination of the recent changes in the Corps regulations which have enhanced violators' chances of obtaining after-the-fact permits.

Problem - Continued pressure by the phosphate mining industry to mine wetlands.

Solution - Prohibit mining in highly valuable wetlands. Ensure that permits for mining in wetlands of moderate value are conditioned to require wetland restoration. Need more staff and travel money.

Problem - Increasing drainage of swamps to plant pine trees.

Solution - Require individual permits. See discussions for North Carolina and Georgia.

Problem - Continued expansion of agricultural operations into the wetlands south of Lake Okeechobee. This expansion further threatens the water quality in much of South Florida.

Solution - Continued review of individual permits. Need more staff and travel money to improve coordination with State and Federal agencies.

Alabama

Problem - In the port area of Mobile, the existing sites for industrial development are rapidly being used. Pressure is increasing to fill shallow water areas to accommodate industrial development. This expansion threatens water quality and the fishery resources of Mobile Bay.

Solution - Existing shallow water areas need to be maintained. Permit applications should be denied.

Mississippi (Inland)

Problem - Thousands of acres of forested floodplain wetland continue to be converted to agricultural use. Not only are the wetlands and their water quality menaced and habitat values destroyed, but the additional croplands contribute runoff that further impacts streams already degraded by existing agricultural pollution. Pesticide contamination of sediments and fish in Mississippi River Valley streams is among the worst in the country. The loss of wetlands results from the failure of the Corps or EPA to adopt jurisdictional boundaries that include all significant floodplain wetlands and conversion of wetlands to farmlands.

Solution - The Corps and/or EPA need to adopt wetland jurisdictional boundaries including all floodplain wetlands that play a significant role in water quality maintenance and wildlife enhancement. Additionally, land clearing and subsequent conversion to cropland needs to be regulated so significant floodplain wetlands are protected. Legal precedence for the regulation of wetland clearing has been established (i.e., Avoyelles Sportsman League versus Clifford Alexander, *et al.*). Support by the EPA Administrator would be needed.

Tennessee

Problem - Destruction of thousands of acres of bottomland hardwoods. Soil eroded from hilly farmland fills streams and is deposited around trees in adjacent swamps. Farmers cut the trees, build levees to protect the area from flood waters, and use the protected land for farming. Construction of the levees increases the flood elevations downstream.

Solution -	See comments on similar problems in Mississippi. Litigation resulting from damages caused by higher floods may tend to restrain the building of levees.

Kentucky

Problem -	Destruction of bottomland hardwood swamps by channelization, conversion to agriculture and surface mining.
Solution -	See comments for Mississippi and Tennessee.

3. Review the Dredge and Fill Permit Program

The most severe problem with the administration of the Section 10/404 review program is the recent Memorandum of Agreement (MOA) between EPA and the Corps. In order to increase the efficiency and effectiveness of the program, we recommend that the current MOA with the Corps be modified after consultation with the Region.

This Region has adequate experience with the 404(b) Guidelines to determine that only minor changes need to be made in that document. The current guidelines work extremely well. Meeting between Regional and Headquarters staff held at least annually are essential for effective coordination.

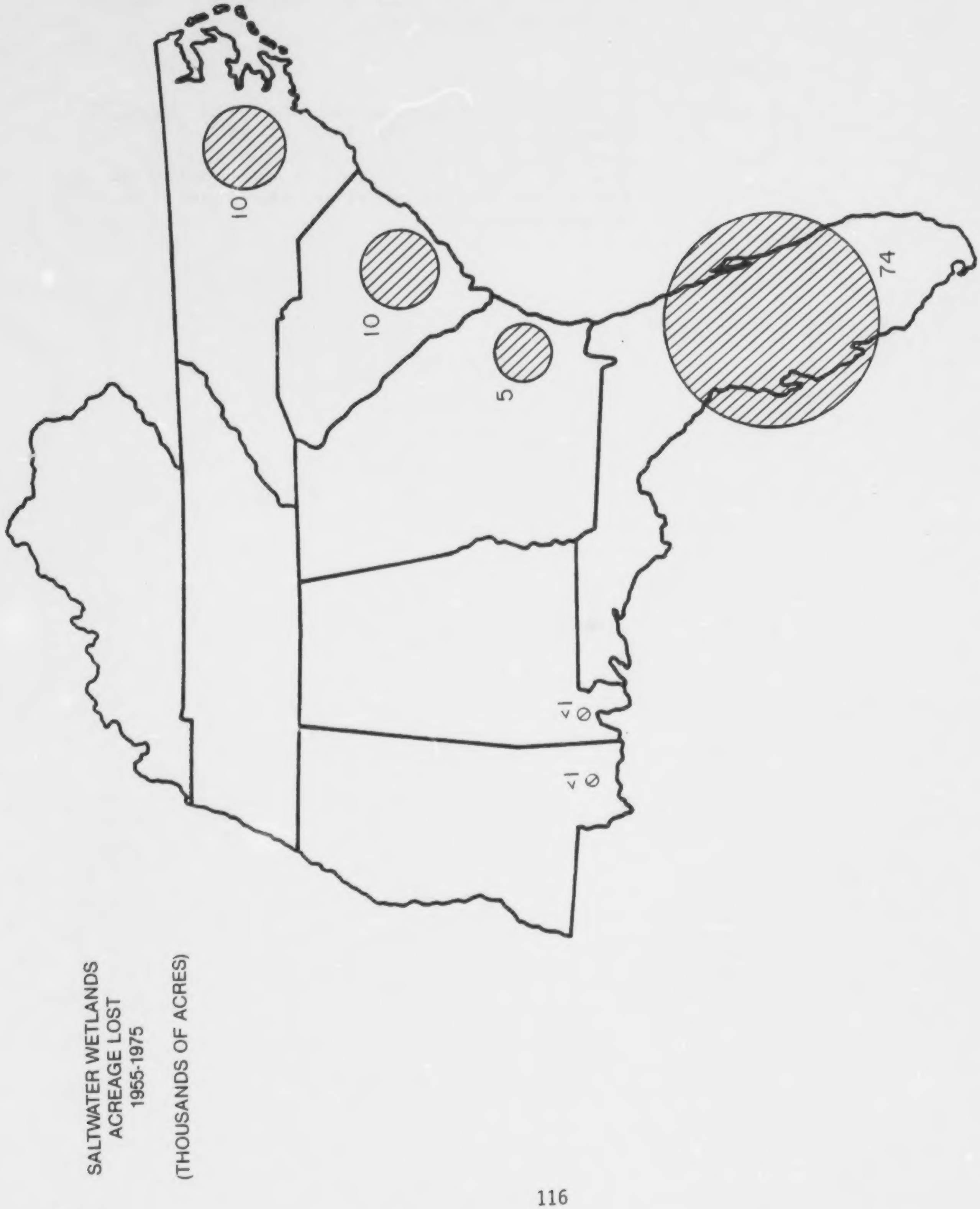
4. Review of Problems with Dredge Spoil Disposal from Federal Navigation Projects

Disposal of dredged material from Federal navigation projects is becoming a critical problem. For the past 15 years the Corps has come under mounting pressure to mitigate the environmental impacts of the disposal of dredged spoil material. Many harbors are running out of disposal areas and, in many instances, the Corps will not be able to obtain either upland or wetland disposal areas. EPA Region IV has for years encouraged the Corps to develop suitable equipment for transportation of dredged material from the harbors and access channels to the Atlantic Ocean or the Gulf of Mexico. Studies by the Corps show that the technology exists and that in many cases ocean disposal of material dredged from the harbors is cost effective. At this time we need strong support and leadership from the Administrator to help convince the Corps that the time has come to move forward with this program in a meaningful way.

Solution - Disposal in the Gulf or near-shore shallow waters of the Sound.

Kentucky

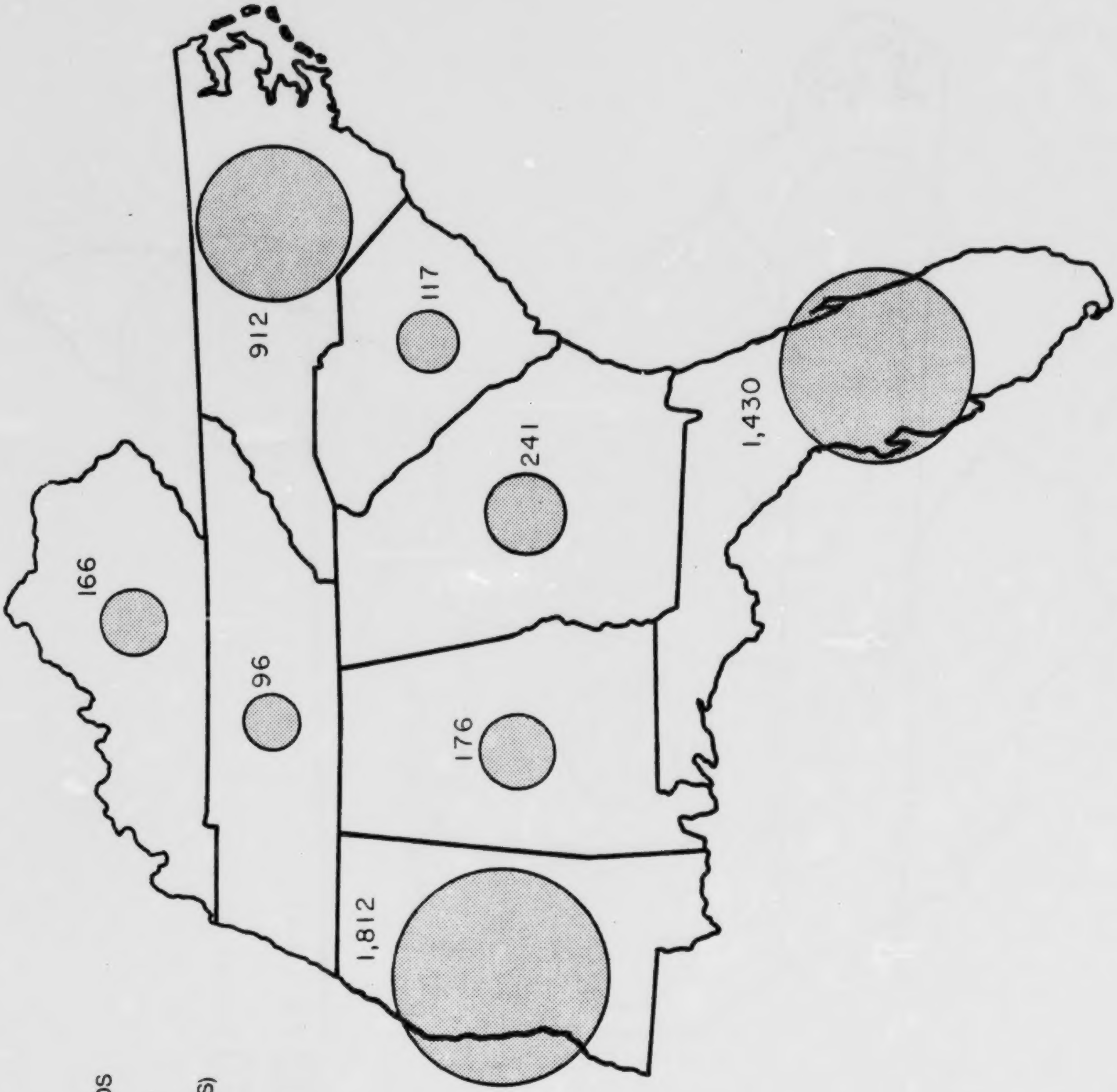
Problem - Freshwater wetland areas are used as spoil disposal areas. The loss of wetlands is proceeding at a rapid rate. Big Sandy drainage has problems with coal dredging in the river and disposal of the resulting dredge material.


10
10
5
74
<1
0
<1
0

SALTWATER WETLANDS
ACREAGE LOST
1955-1975

(THOUSANDS OF ACRES)

Figure W - 1


912
117
241
1,430
166
96
176
1,812

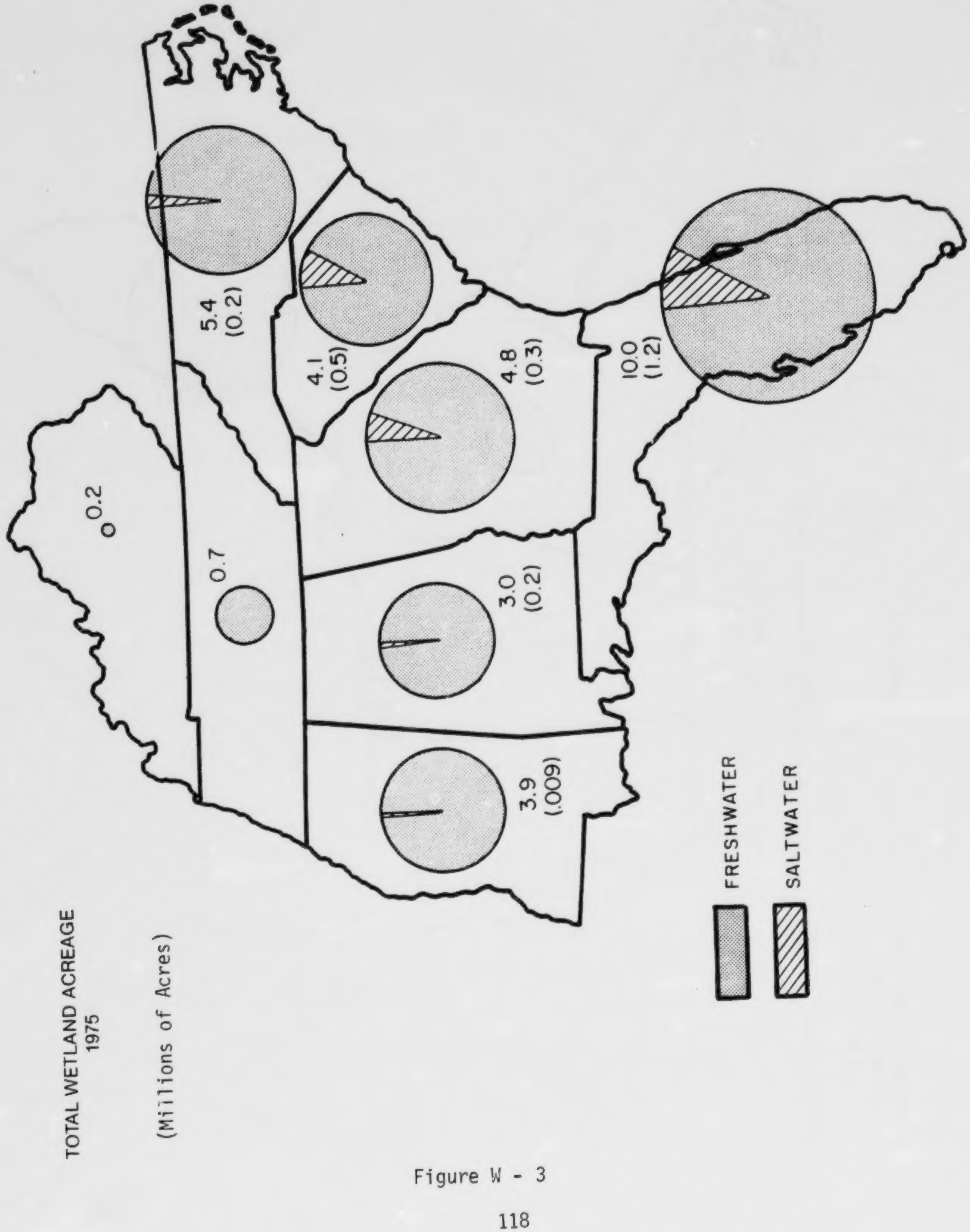
FRESHWATER WETLANDS
ACREAGE LOST
1955-1975

(THOUSANDS OF ACRES)

Figure W - 2

TOTAL WETLAND ACREAGE
1975

(Millions of Acres)


5.4
(0.2)
4.1
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(.009)
FRESHWATER
SALTWATER

Figure W - 3

HAZARDOUS WASTE--RCRA

1. Overview

The hazardous waste regulations are issued under the authority of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA). Subtitle C of RCRA establishes a federal program to provide comprehensive regulation of hazardous waste. RCRA directs EPA to identify the characteristics of, and to list, those hazardous wastes which are subject to regulation. RCRA also requires EPA to establish standards for generators, transporters and treatment, storage and disposal facilities of hazardous waste, which will ensure proper handling of hazardous waste. For those states interested in administering the RCRA program instead of EPA, the regulations issue guidelines under which states may seek authorization to carry out the program. Finally, all persons engaged in activities subject to RCRA regulations must notify EPA or states having authorized RCRA hazardous waste programs.

Region IV has maintained an aggressive RCRA program in delegation of authority to the states (Figure R-1). All eight states in Region IV have Phase I Interim Authorization. Five states have been delegated Phase II Interim Authorization, Components A and B. Although it will take a great deal of effort and commitment by both EPA and the states, it is expected that seven states will receive Phase II, Component C, sometime in 1983 and all Region IV states will be granted Final Authorization by early 1984. To achieve that optimistic prediction, there are a lot of hurdles to overcome.

The approval process which the agency has adopted requires multiple networking and crosswalking coordination. The review and approval process is cumbersome and time-consuming. Legislative changes and regulatory changes are very difficult to achieve in these austere budget settings. Many states have hiring freezes which do not allow them to achieve the resource levels which were predicted.

These problems result in a slowing of the authorization process which in effect increases the workload on the EPA staff. The process of Final Authorization is expected to be slower and more cumbersome than the interim process due to the finality of the agency's decision.

The Agency's groundwater strategy must encompass and embrace the RCRA permit program. These permits for land disposal facilities are a principal part of protecting the groundwater resources of the region. The states will administer the RCRA permit program in the Southeast; however, they are dependent upon EPA for financial assistance, technical assistance and as a mainstay in difficult enforcement areas. The EPA laboratory support is also the foundation upon which state laboratory support builds. States rely upon the EPA laboratory for quality assurance, training and evaluation of new procedures and methodologies.

Figure R-2 shows a large degree of compliance with 265 requirements by the Treatment, Storage, and Disposal Facilities (TSDFs). Some exceptions to the compliance are groundwater monitoring and financial assurance. These areas are receiving increased emphasis by the state programs during FY 83. The states have realized that many of the real environmental problems will be highlighted by the groundwater data. The financial assurance regulations have not been in effect long enough in most states for them to know the degree of compliance. They are aggressively receiving the submission and working through their compliance staffs to achieve a high degree of compliance. The states recognize the importance of having the financial resources available should environmental problems develop in the future.

The permit program is in its infancy. The numbers of true TSDFs which need a permit are far less than the present data base indicates. The part B call letters to date have resulted in a high drop out rate. As the calls proceed, the regulated community will have to address the questions which require them to decide if they in fact want and need a permit (Part B preparation cost, financial assurance cost and liability for post closure).

The permit applications received have to date been of poor quality which increases the review time. This is further addressed under problem areas.

The Act, the Agency and the States anticipate improved air, surface water and groundwater quality as a result of the RCRA regulatory program. This premise cannot be quantified at this time because of the lack of a good data base. Progress will become measurable as the complete inventory is developed of the regulate community and the types and volumes of waste generated, transported, disposed, treated, and recycled. The data from the permit application will be needed as well as the historical compliance data to accurately measure the total environmental effect.

As the program proceeds, it will develop into actual measures of progress and quantifications.

2. Problem Areas

a. Regulations

From the experience in regulating hazardous wastes under the present RCRA regulations, several areas where the regulations do not adequately address the problems encountered have been identified.

(1) Synfuel Facilities

One area of concern in Region IV is the impact on public health and the environment created by wastes from synfuel facilities. The wastes generated at these facilities are in large volume and contain many organics, some of which are carcinogenic. Much of the solid waste from these facilities is included in the Congressional exemption for mining waste and thereby in the RCRA regulation at 40 CFR §261.4(b)(7).

Of the twelve major synfuel facilities planned for the region, four are located within a 40 mile band along the Ohio River in Kentucky. The solid wastes containing toxic organics, and the air emissions from these four facilities plus five additional conventional coal fired generating plants existing or planned for the same 40 mile band provide the potential for the development of significant public health and environmental problems. More information is needed on the hazards associated with synfuel wastes. Should these wastes be fully regulated by RCRA?

At present, as solid wastes only, these and the large volumes of wastes from coal fired plants are regulated by the states using state resources. The large volume of fly ash produced at coal fired plants is exempt from being a hazardous waste by 40 CFR §261.4(b)(4).

(2) Hazardous Air Emissions

Air emissions from hazardous waste facilities in the form of volatile organics and gases are a problem at facilities with surface impoundments, land treatment facilities and open tanks. The regulations do not address low concentration nor do they provide adequate methods for establishing non-compliance.

(3) Recycling

A number of facilities that recycle or reuse hazardous wastes have, in the past, caused significant damage to the public health and the environment. Under the present regulations, many of these facilities can store hazardous wastes that are hazardous by characteristics only for an unlimited time without having to meet any RCRA standards.

The new definition of solid waste may address this problem, but until the regulations are changed, a large inconsistency exists in the regulations.

(4) Burning Hazardous Waste as Fuel

If a waste is burned as a fuel, it is exempt from the definition of a solid waste (40 CRP §261.2(c)(2)). At present, EPA has no definition of a fuel. A waste that is ignitable and toxic can be burned for "energy recovery" without having to meet any standards under RCRA for toxic emissions. Most of the toxics produced are not addressed by either the Clean Air Act or any state air pollution laws.

b. Growth and Waste Generation Increase

A recent study, The Southern Regional Environmental Assessment, Environmental Status Report, Volumes II and III, predicts that industrial production in the sunbelt (Region IV) will increase substantially by the year 2010. The greatest increase is projected in major hazardous waste producing industries (Table R-1). With the increase in production, an increase in hazardous waste generation is projected. This increase translates to the potential for greater and more environmental problems in the Southeast. Furthermore, this increase in hazardous waste generators will necessitate increase in state and regional efforts to protect the groundwater in the region. Groundwater is one of the Southeast's most important resources. In 1970, 70 percent of the population in the Southeast obtained drinking water from groundwater sources. Protecting this resource is vital now and in the future (see the Groundwater Section).

(1) Small Generators

Along with the increase in large generators of hazardous waste is an expected increase in industries generating less than 1000 kg of hazardous waste per month. These industries can dispose of their waste in state approved solid waste landfills. This and the projected increase will put an additional burden on the state disposal facilities. As the RCRA regulations are implemented, industries seem to be switching to off-site disposal methods. This increases the need for new off-site disposal facilities. In siting hazardous waste and solid waste disposal facilities, much public opposition is generated.

(2) Public Opposition

Intense public opposition has blocked siting of new hazardous waste management facilities, forestalled expansion of existing facilities, and, in several instances, caused operating facilities to be closed. A study on the capacity of the hazardous waste management industry concluded that public opposition was the most critical factor affecting future capacity (Booz Allen Hamilton, and Putnam, Hayes & Bartlett, 1980, p. VI-1). Dealing with this opposition is very resource intensive at both state and federal levels. At the Regional level at least two workyears are devoted to giving technical assistance to the state solid waste program and responding to the public's information requests, questions, letters and complaints on solid waste collection, transportation and disposal. A program of public relations and education would reduce some of the opposition and the resulting burden on state and federal resources needed in issuing a permit.

(3) Solid Waste (Non-Hazardous) Disposal

The increasing population in the Southeast, as well as increasing industrial production, brings significant increases in non-hazardous solid waste generation. These wastes must be safely disposed after collection. The predominant disposal method in the Southeast is still landfilling. The trend of cities, counties and other local authorities responsible for solid waste management is to wait until the situation becomes a crisis before taking positive action due to public opposition to landfill siting.

The siting of landfills for non-hazardous solid waste is a drain on regional resources although the Region has no resource allocation for this task. The Region must respond to complaints, congressional questions and requests for information.

(4) Recycling and Waste to Energy

The Agency has ceased to provide any leadership in the area of recycling solid wastes or waste to energy. States, while supportive of these efforts, do not have the resource expertise or legislative charge to provide this leadership in most cases. The impetus for these activities should be provided at the national level. This could be in the form of financial assistance to states to develop recycling programs or to maintain and expand existing programs.

(5) Large Commercial Land Disposal Facilities

The two large commercial land disposal facilities in the Region accept large quantities of hazardous waste from all over the nation. The host states, Alabama and South Carolina, expend considerable resources in regulating these facilities. The present grant formula does not take this extra workload into account. Along with the increase in workload at the facilities, the facilities create additional problems associated with increase in transportation of waste and the potential for accidents. Citizen concerns about the groundwater and surface water contamination for these facilities result in a substantial increase in workload for the state regional staff.

c. Emerging Problem Areas

(1) Annual Report

In determining workload, resource allocations and trends, it is important to know the type, quantities, distribution, and method of handling and disposal of wastes across the country. This was the purpose of the annual report for generators and TSD's. All of the Region IV states are requiring an annual report. Most were requested to do so by their state legislators in order to have better data to allocate resources and assess the need for new legislation. Annual submissions are expected to continue to be required by the states which creates confusion when EPA requires bi-annual reports. The annual report should be retained.

(2) Groundwater

In the area of groundwater monitoring and groundwater monitoring reports, several problems exist. Facilities have been monitoring the groundwater for only one year and the data are just coming in to the states. Therefore, we cannot know yet what contamination problems exist at the majority of the land disposal facilities. At facilities where obvious groundwater contamination exists, corrective action has been initiated. But there are a very limited number of the total facilities subject to groundwater monitoring. Additional facilities with groundwater contamination are certain to be found. Adequate data to make that determination do not exist at this time. An additional problem is quality control of all aspects of the groundwater monitoring program. There is no provision in RCRA or state law for regulation requiring quality control (i.e., state monitoring of well installation) nor is there any provision for requiring quality control of the sampling analyses of the groundwater samples. The data obtained may not be adequate for use in permit application or any enforcement actions. There is a need for additional regulation in this area.

(3) Training of State Personnel

Training of state personnel is an area not adequately addressed in the RCRA program. Most of the state programs and personnel are new and not familiar with the complex hazardous waste program. Training given at the state level only gives the employee a view of the state program. It is important for all state hazardous waste personnel to have an understanding of the federal program. Unlike the Clean

Water Act, RCRA has no treatment plant operator training. Some provision should be made to develop training for state personnel by EPA on all aspects of hazardous waste management. This could be done through the state grant.

(4) State Authorization

The final authorization process may be long and difficult and consume many workyears of effort, not only at Headquarters and state levels, but especially at the regional level. In order to meet the January 1985 deadline for final authorization, work has already begun in earnest at the state and regional levels to identify and notify states of any and all problems that must be corrected in order to receive final authorization. The actual application review process will take at least 270 days if no major problems are encountered. This means January 1984 is when application should be submitted to EPA. With some state legislatures meeting only once every two years, the states will have only one chance to get any needed changes through the legislature. The possibility definitely exists for states to lose their authorization because of failure to receive final authorization by the statutory date.

Many problems can develop at the state level that may delay or prevent them from receiving final authorization. Obtaining agreements from other state agencies is often a problem. Obtaining commitments from the State Attorney General is very often a major stumbling block.

At the regional level, the workload associated with coordinating the review of the states' applications by the Region and Headquarters review teams, negotiating solutions to the problems encountered, and coordinating with the states on any revisions needed will be a monumental task requiring many workyears of effort per state.

The following is a brief description of possible impediments each state in Region IV may experience in obtaining final authroization of the RCRA program:

- Kentucky

Kentucky is experiencing problems with two statutes - special waste and confidentiality. These problems must be remedied for the January 1984 legislative session. This places Kentucky on a restrictive schedule for final authorization.

- Tennessee

Tennessee also needs statute revisions in the following areas:

- Increase penalties to at least $10,000

- Allow for citizen intervention
- Authority for Liability Insurance
- Revise TCA 6305(c) regarding air and water permits

. North Carolina

North Carolina is introducing legislation to allow for citizen intervention during the January 1983 session. If it passes, there should be no obstacle to receiving final authorization.

. South Carolina

South Carolina intends to introduce new legislation and revised regulations in the January 1984 session - this will put them on a tight schedule for receiving final authorization.

. Florida

Present state statute may require a change. It has been determined that the 90-day "Permit by Default" provision is a problem. The state program cannot be delegated Phase II until that provision is changed. Also, because Florida's financial requirements will not be effective until July, they may not be able to get Phase II until that time.

For final authorization, the 90 day "Permit by Default" is also a question that must be answered. An additional problem is an EPA requirement that the landowner as well as the operator sign RCRA permit applications. Florida has a waiver provision in this area, EPA does not.

. Georgia

Georgia is adopting federal regulation by reference, and recent amendments to the state rules should qualify the state for final authorization.

. Mississippi

No problems are expected in granting Mississippi final authorization.

. Alabama

Alabama has failed to pass legislation to regulate railroads in a manner equivalent to the federal program. As yet, Alabama has not enacted all financial responsibility regulations, and must adopt the land disposal regulations. Also, Alabama statute S-22-30-12(c)(1) states that permit applications must be approved or disapproved within 90 days.

Thus, they may be forced to issue permits by default if the permit process cannot be completed within 90 days. This problem must be resolved prior to final authorization.

Should the Alabama legislature reject the repeal for the 90 day default permit, EPA would be required to assume authority for the total RCRA program. The environmental impact of this situation would be a longer period of time for these TSDF's to be under interim status, because the permits issuance would be delayed. This could translate into additional groundwater problems developing as well as public exposure to air emissions.

(5) Small Quantity Generators

Along with the resource problems at the state level mentioned above, small quantity generators create additional problems. The major problems are lack of knowledge about how much waste is generated and where it is going for disposal. The disposal of one thousand kg of hazardous wastes every month by a number of industries into the same municipal landfill is creating the potential for severe environmental and human health problems.

All Region IV states feel additional control of the small quantity generators of wastes is needed. They have addressed the problem in several ways. All eight states are using their solid waste laws to control these wastes to the extent possible under their laws. However, several states have felt the need for additional control under their hazardous waste regulations. This ranges from requiring notification to reducing the small quantity limit to one hundred kg/month.

(6) Permit Application Quality

Region IV has called 123 storage Part B's and 11 incinerator Part B's as of February 1, 1983. Review accomplished to date on these applications has indicated a substantial lack of understanding of the regulation of lack of managment emphasis at the corporate level. These applications have substantial areas where the information is missing and/or the information is of quality so poor that it is inadequate for use in issuing a permit.

The net effect is a heavier workload for the Regional staff through review and response, technical assistance and/or enforcement to get an application which is of the quality needed to enable the staff to prepare a draft permit and fact sheet.

Leadership at the national level is needed to: 1) impress industry with the need for the type and quality of information needed in a permit application; and 2) to impress industry that submission of a complete and adequate permit application is mandatory and failure to submit an adequate application is grounds for enforcement action and/or permit denial.

(7) CERCLA Remedial or Planned Action - RCRA Permits

CERCLA remedial and planned actions at sites can involve the same activities which require permits at active RCRA facilities. Do federally funded, state, or privately funded activities at CERCLA sites require RCRA permits? The Agency has not resolved this issue to date.

The implications are significant in terms of workload for regional and state permitting staff. Conflicts arise between cost effectivenesss and the RCRA standards. Potential resource drains, such as responding to public comment if permits are required, must be considered during policy discussions.

(8) Permitting Land Disposal Facilities

Although the land disposal regulation went into effect January 26, 1983, Region IV anticipates significant problems in getting good quality, complete land disposal permit applications. The regulated community does not have a good understanding of these regulations and to date we have not seen the effort needed from the national program to assist industry in understanding the requirements so they can prepare a complete and useable Part "B" Permit Application.

Significant technical and time consuming enforcement problems with public opposition are anticipated before these permits are issued. Issuing these permits may be a lengthy process.

3. Implications for Agency Management

The issues in Region IV are arranged below according to degree of impact in regional resources and their impact in human health and the environment. The issues are arranged in descending order of importance to the region.

a. Barriers

(1) Population and Industrial Growth in the Region

The predicted increases will necessitate additional resources. If these resources are not available, the Region will not be able to handle the additional workload. Workload models should reflect growth.

(2) Groundwater Data

The Agency needs to develop procedures and regulations to insure reliable groundwater monitoring data to be collected and reported by the TSD's. Lack of reliable data will hinder our timely issuance of land disposal permits, and increase the workload associated with permitting.

Because of the uncertainty of the methodologies used to determine when a facility caused groundwater contamination to exceed background levels, enforcement based on the 265 standards which require correction by the facility may not be timely.

Some states have groundwater standards which can be independently enforced, but most follow EPA's lead.

(3) Burning Hazardous Waste as Fuels

More emphasis should be put on developing a workable regulatory definition of a "fuel". The present lack of regulations forces the regional staff to make time consuming case-by-case determinations based on best professional judgment. Recent guidance has helped, but regulations must be updated.

The burning of halogenated compounds with no regulatory controls exposes the public unnecessarily and degenerates the environment. Region IV recognizes the goal of beneficial reuse but cannot sacrifice environmental quality for energy without assessing the cost.

(4) Permitting Land Disposal Facilities

Because of public opposition and industries' lack of understanding of the land disposal regulations, the regional permitting workload will be increased. Additional resources will be needed in the Permitting Section.

(5) State Authorization

The long and difficult process of final authorization will be very resource intensive at the regional level. Region IV feels that more resources are needed in this area to make maximum effort towards meeting the January 1985 deadline for final authorization as provided for in RCRA.

(6) Recycling

The regulations are inadequate in this area to control recycling activities that have caused problems in the past. Many recycling activities that are legitimate and beneficial with little potential for damage are being over-regulated. More Headquarters resources should be devoted to revising this area of regulation.

(7) Permit Application Quality

Poor quality of the Part "B" application is creating an additional workload for the regional and state permit staff. More emphasis needs to be placed on training for industry, and on impressing upon the regulated community that submitting a good quality Part "B" is mandatory.

(8) Solid Waste (Non-Hazardous) Disposal

The siting of landfills for non-hazardous solid waste is a drain on regional resources, although the Region has no resources allocated for this task. Resources should be shifted to this area.

(9) CERCLA Remedial or Planned Activities

Do activities at CERCLA sites require RCRA permits? The agency has not resolved this issue. Implications are significant in terms of workload for regional state permitting staff.

(10) Hazardous Air Emissions

When air emissions occur at hazardous waste facilities, the current regulations do not provide adequate methods to establish non-compliance. Headquarters' resources should be shifted to address this area. Regionally, making case-by-case judgements is consuming additional resources.

(11) Small Quantity Generators

This regulation can allow large total amounts of hazardous waste to be disposed of in non-RCRA, inadequately designed disposal facilities. The regulations should be modified to provide greater control of these wastes.

(12) Synfuel Facilities

Exemptions in the regulation for many of these wastes may be adding to potentially hazardous situations. Additional resources to study the hazardous characteristics of these wastes should be shifted to this area. The exemption impacts heavily on state resources.

(13) Training of State Personnel

To insure consistency across the Region and the country, EPA training in all aspects of the RCRA program should be given to all state hazardous waste personnel. At present, the regional staff has to try to coordinate all the state programs. This is an additional workload where resources are not allocated.

(14) Annual Report

Retention of the annual report requirement will provide much-needed data that can be used to allocate resources and assess needs for new regulations or legislation.

(15) Support of Recycling Activities

The Agency has ceased to provide any leadership in the area of recycling of solid waste to energy. This is a fundamental part of RCRA. Region IV is of the opinion that the impetus for these activities should be at the national level.

(16) Large Commercial Land Disposal Facilities

Region IV's two very large commercial hazardous waste landfills drain the host states'(South Carolina and Alabama) resources and the regional resources inordinately. The Subtitle C grant formula should give some consideration to this resource drain for these states.

b. General Conclusions and Recommendations

(1) The Agency must continue to stress the development of additional regulations and the regulatory amendments needed to implement the program.

(2) The Agency must provide clear and consistent regulatory requirements.

(3) The Agency should look at growth and growth potential indication for use in resource distribution among regions.

(4) The Agency must address the public opposition to commercial hazardous waste facilities (landfills, incinerators, and processing/storage facilities). The economy of the nation, the health of the population, and the environment depend upon these facilities.

(5) In support of number 4 above, the Agency should emphasize recycling and reuse through tax incentive and publicize good recycling and reuse technology which results in decreased need for disposal.

(6) The Agency needs to address the training needs for state programs through the National Governor's Association and the Association of State and Territorial Solid Waste Management Officials, and provide national leadership.

(7) The Agency should decide if RCRA permits are needed for CERCLA activities.

(8) The Agency should publicize its dissatisfaction with the quality of the RCRA permit applications received to date and let industry know this will not be tolerated.

TABLE R-1: GROWTH PROJECTIONS FOR MAJOR HAZARDOUS WASTE GENERATORS

	Projected Growth (earnings--millions of dollars)[a]			
Industry	1978	2000	2010	% Change 1978-2010
Chemical and Allied Products	2,509	5,816	7,738	+208
Stone, Clay, and Glass Products	766	2,941	4,015	+254
Fabricated Metal	1,764	4,811	6,593	+273
Petroleum and Coal Products	124	412	571	+360
Textile Mill Products	4,391	7,222	8,962	+104
Primary Metal	1,590	3,804	5,095	+220

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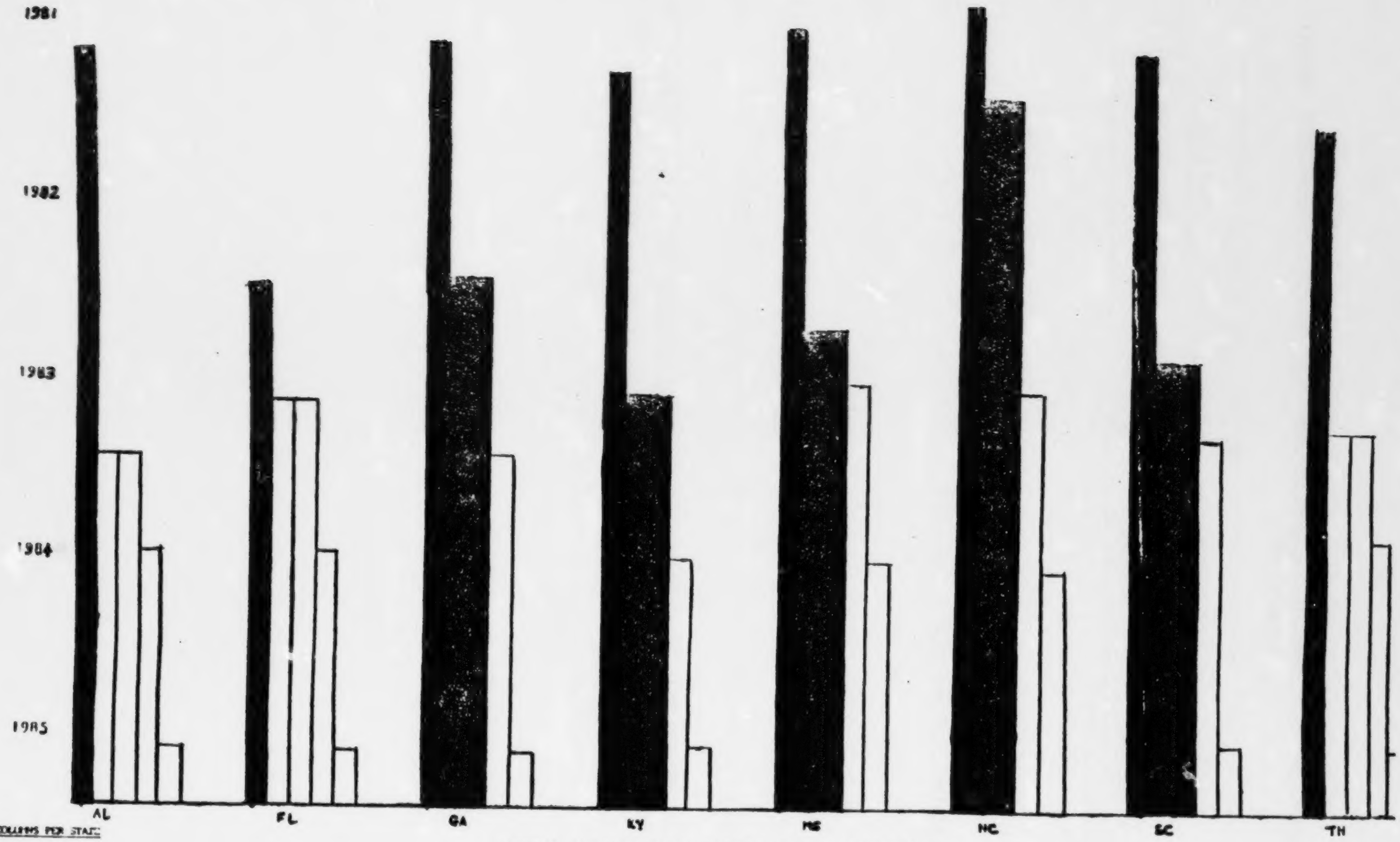
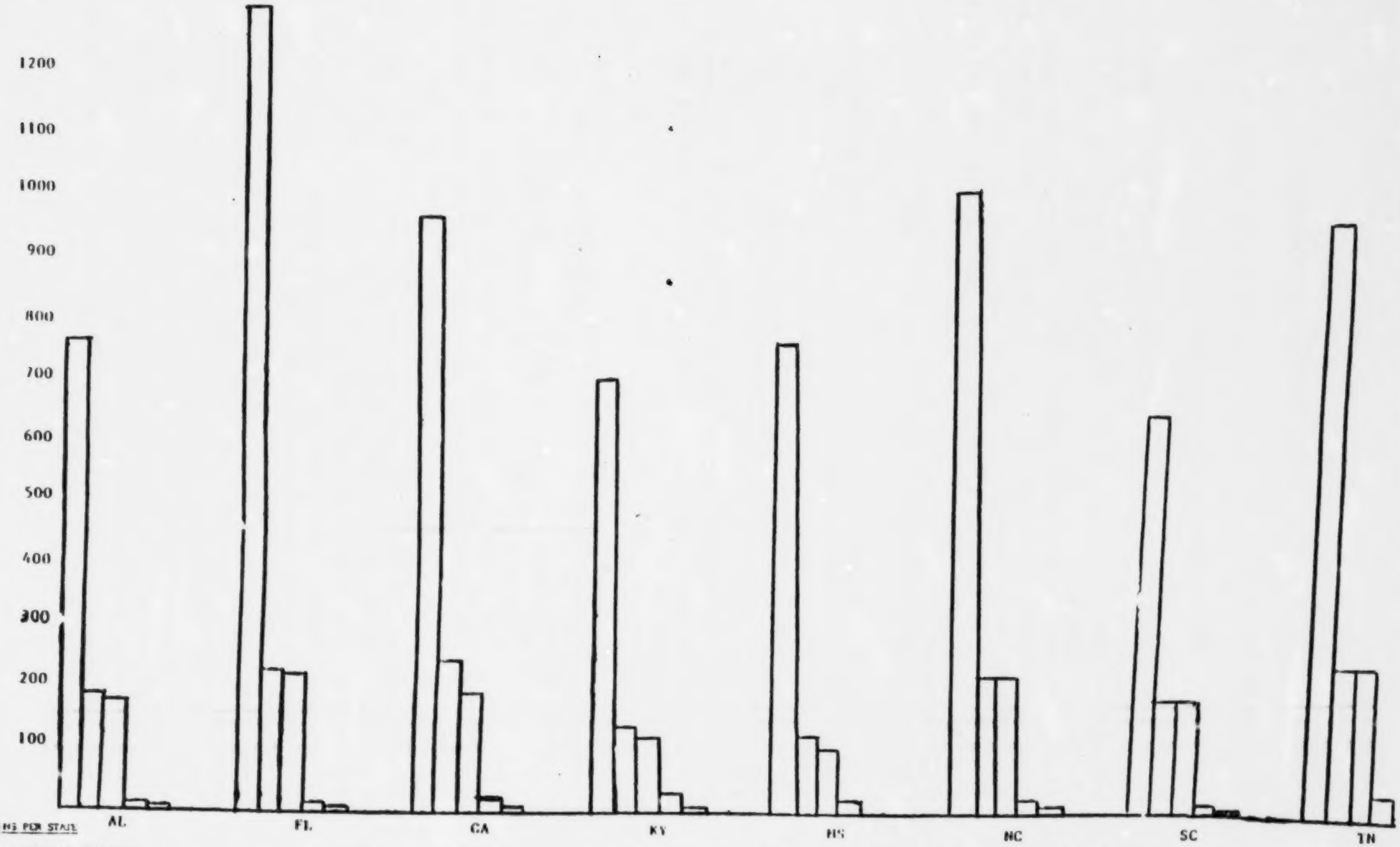
[a] Calculated from U.S., Dept. of Commerce, BEA, 1980. This data is taken from Tables 4-3 and 4-4, Chapter 4, of this report. Figures are millions of 1972 dollars.



ACTUAL AND PROJECTED DATES RCRA AUTHORIZATION

Region IV States

Figure R - 1



Number of RCRA Generators, TSDF, Part B's called, Part B's received, and Permits issued

Figure R-2

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HAZARDOUS WASTE--SUPERFUND*

1. Site Screening of Inactive Disposal Sites

a. Performance and Trends

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also called "Superfund") provides for response to a hazardous substance release in order to protect the public health, welfare, or the environment. Either the responsible party or the government will provide proper response to the release. Identification, assessment and hazard ranking activities by Region IV's Site Screening and Engineering Section (SSES) has resulted in 2,978 sites for the ERRIS tracking system (19.3% of the national total of 15,457), and 48 inactive disposal sites on the Proposed National Priority List (NPL).

The projected distribution of site assessments in Region IV for each State is presented in Figure S-1. It is possible that highly hazardous sites will be uncovered as on-site inspections are conducted by states over the next two years. Developing background material on these sites for the NPL will put a demand on the site screening and assessment workload. A rough estimate would indicate that 10-12 additional sites are likely to be proposed for the NPL in FY '84.

b. Emerging or Remaining Problems

(1) State Participation in Program

The management philosophy adopted during implementation of CERCLA has involved consolidation of decision making authority at Headquarters, hierarchical review and overview of Regional recommendations, and direct involvement of Headquarters Staff in specific activities. This has diluted the Regional role as principal contact point for the state agencies, and exacerbated traditional reluctance to participate compliantly in Federal programs, with the result that Regional ability to elicit state participation in the CERCLA progam has been inhibited. Note also that there is no provision in CERCLA for delegation of the program to the states, as in other laws administered by EPA. Unless Regions are delegated greater authority to initiate action, and a clearer policy of pressing the state agencies to participate is forthcoming, the reluctance by states to participate in a non-delegated Federal CERCLA compliance and enforcement program will be even greater than in the past.

Because of the rapidly developing Superfund policy in the Agency, many of the suggested changes in this write-up are now being addressed. This discussion was written prior to the initiation of the recent Superfund policy changes.

(2) Cost Recovery Action Guidance

In the near future, the pursuit of cost recovery actions to recover monies disbursed from the Fund for investigation and remedial action will become a significant activity. There is, as yet, no adequate guidance defining (1) the types of costs which are recoverable, (2) how recovered monies will be distributed between states and the Fund, (3) how expenditures and environmental improvements are to be documented in order to demonstrate cost-effectiveness of remedial work, (4) how costs are to be assigned or distributed among multiple responsible parties, and (5) what standards of proof are to be met.

(3) Management Data Collection

Following promulgation of the National Priority List there has been significant management attention focused on the "Responsible Party Search" as a measure of progress. This may not be an appropriate parameter, since the identification of responsible parties is a continuing process through the entire life of the project, and is often most fruitful after specific compliance actions are initiated. Virtually every site has a responsible party search initiated; few are completed at the time management data are collected. Furthermore, management data are presently collected in a piecemeal fashion by separate staff sections, apparently without use of the ERRIS or PTS Systems developed for the purpose. This results in redundant reporting by the regions and introduces the possibility of discrepancies in data reported to the separate systems.

2. Remedial Action

a. Performance and Trends:

Region IV has 11.5% of the Nation's total 418 inactive disposal sites on the National Priority List Placement on the NPL urges a response to every one of the listed sites, whether by a form of enforcement or fund-financed cleanup. Of the 48 Region IV sites, enforcment is pursuing cleanup at 30 (or 62.5%) of the sites, while fund-financed cleanup is being actively pursued at 7 or (14.6%) of the sites. Because states must provide cost sharing for remedial activity at a listed site, six of the sites (or 12.5%) are being held back by the states because of a lack of funding. The following chart, titled "Action Taken in Region IV NPL Sites," highlights the activity at each respective site.

As work on hazardous sites has commenced over the past years, it has become evident that a great deal depends on the data gathered at each uncontrolled site. There is a significant lack of information concerning acute and chronic hazards of many abandoned chemicals. Further, there is little correlation between the toxicity of specific chemical and hazards to the public health. The question of how clean is clean depends on the interpretation of the data and the long-term public health effects of residual site materials. This public health issue can lead to difficulties in public relation programs. The government is required to deal effectively with each community for funded site work, however, private parties are not required to initiate public relations programs. This has resulted in lack of public participation in cleanup alternatives and lack of knowledge regarding progression of work.

b. Emerging or Remaining Problems

(1) State Matching Funds

The cleanup of sites on the National Priority List has been slowed in Region IV by the requirement for state matching funds throughout the process.

Currently, five of the eight States in Region IV have no mechanism to create a fund for use at these sites and, therefore, must appeal to their legislatures for funding. Throughout the Region, as well as the Nation, the economy has made it very difficult for the States to find the necessary dollars within their limited budgetary constraints. The States which have created funds are: Florida, whose legislature created a $600,000 fund to use as State match; Mississippi, which has developed a penalty fund which presently has less than $50,000 available; and Kentucky, which has collected about $200,000 by taxing generators. Alabama recently set aside $510,000 in their FY-84 budget as a contingency fund for cleanup activities. These schemes are functioning, but appear to be inadequate in the magnitude of funds which they have yielded.

The states of the Region are not insensitive to the hazards associated with the listed sites, however, budgets are planned, other expenditures hold a higher priority. This dilemma could be alleviated to some degree by removal of the requirements of matching funds for remedial investigations and/or feasibility studies. This would yield immediate results in that more sites would proceed through these preliminary steps. Requests for funds from state legislatures could then be based on "harder" figures.

Direct taxation and penalties (user taxes) continue to be viable means of funding, but other states should consider special bond issues, special tax schemes or any of the other funding mechanisms available to the states. If Superfund is to complete its mission, the cooperation of the states is imperative. They will have to come forward with funding from some source.

(2) Timeliness of State/EPA Cleanup Agreements

Another problem inherent in all cases is the amount of time involved in putting together an enforcement agreement or the contract between a state and EPA for fundng a remedial activity. Discussions with responsible parties can be delayed for various reasons, such as additional time for scope of work preparation, wording of the Order, and the need for getting together of many generators.

Some of this time could be shortened by concerted attention to deadlines and up-front negotiations. Remedial contracts between the state and EPA undergo extensive reviews at the state, regional, and headquarters level. The review process takes at least two weeks at each level for both the draft and final agreement. The time factor is a pressing issue now that the legislation has less than three years before sunsetting. On an average, it takes 3-4 years from project initiation to completion, when all phases of work are involved. Superfund PERT charts at the end of this section reflect timelines for fund-financed cleanups at 21 sites. Negotiation with responsible parties is not included and could extend the process significantly.

(3) Groundwater Exposure

Table S-2, entitled "Matrix of Problems at Region IV NPL Sites," and accompanying map indicate the groundwater exposure at most of the NPL sites. In the southeast, most drinking water comes from shallow aquifers, so it is critical to protect. Also the aquifer characteristics are some of the criteria used for evaluating cleanup alternatives. Long-term protection of the groundwater can determine a choice between on-site containment and off-site action.

3. Classical Spills - Immediate and Planned Removal

a. Performance and Trends

Over 2,000 spills of oil and/or hazardous substances occur in Region IV annually which must be dealt with by Region IV's Emergency Response and Control Section. In addition, four removals - three immediate and one planned - were completed during the past year. One planned and two immediate and/or planned removals are projected for the remainder of FY-83. Figures S-3 and S-4 respectively reflect the number of spills reported to EPA during the period 1975 to 1982 and the volume of oil and hazardous substance spilled for the same period.

Emerging and remaining problems for this aspect of the Superfund program concern (1) resource difficulties for implementation of CERCLA response requirements, (2) technological problems (3) inadequate training of local responders, (4) lack of adequate laboratory support, and (5) reporting problems.

b. Emerging and Remaining Problems

(1) Resources

Under CERCLA, the Emergency Response Section is mandated to undertake response activities related to "immediate" and "planned" removals of hazardous wastes from uncontrolled sites. Preparation, response and documentation phases of such activities require intense personnel commitments from this Section. Figure S-5 reflects the significant amounts of material disposed of during these immediate and planned removals.

Inspection of oil storage facilities pursuant to 40 CFR, Part 112 currently requires extensive on scene activity due to more sophisticated and complex engineering plans developed by owner operators in recent years. In 1975, an EPA inspector could perform ten inspections per eight hour day, however, in 1983 he can at best perform 2.5 inspections per day. Further, there are at least 15,000 facilities in Region IV that have not been inspected or need additional inspections.

An emerging problem in this Region has been complex leaks from networks of underground storage tanks containing gasoline or certain hydrocarbon related chemicals. It is estimated that in the state of Florida alone, thousands of such leaks are in progress. The complexities of these leaks involve widespread ground and surface water contamination, as well as the potential hazard of explosion when the leaks enter the sewer system. Because of their frequent occurrence and technically difficult nature, these incidents require extensive testing, monitoring, eventual corrective actions and cleanup of contaminated soil and/or ground or surface waters. Usually a long residence time on scene by an EPA coordinator is needed to complete monitoring of testing procedures and corrective action. Further, special skills such as hydrology, geophysics, geology and structural engineering are needed to make meaningful responses.

(2) Technology

Increased response work with hazardous waste site cleanup and classical spills demands essential technology for each phase of response. Lack of an aggressive research and development program and budgetary constraints have severely impaired completion of ongoing projects with direct relation to emergency response. Such abandoned projects are development of portable incinerators and off shore platforms for incineration.

(3) Training of Local Responders

During the past several years, the pressing need for training of first responders to handle emergency spills/release of chemical substances has become evident. This Region receives numerous requests from fire departments and local government agencies for training on response management technigues, safety and other concerns related to chemical releases. Some Regional program work has been developed to coordinate, or "package", many of the available "responder courses" for reference use by interested parties. In addition, training packages to be developed using Region IV expertise have been proposed. If first responders are properly trained and educated, exposure to the public and the environment can be drastically reduced.

The National Contingency Plan calls for the development of state and local contingency plans. The development of local plans will depend greatly on the training of those preparing the plan. Anyone not familiar with coordinating emergency response efforts will experience difficulty in preparing a complete contingency plan. Again, the training need in Region IV exists and is definitely increasing due to federal budget cuts that will ultimately affect state and local budgets.

(4) Inadequate Laboratory Support

Currently, Region IV's laboratory support program consists of contract personnel who retrieve proper water samples and perform limited air monitoring during emergencies. This support, both in-house and by contract, is inadequate for emergency analytical requirements. An average turn around time of 45 days is the rule rather than the exception. This is unacceptable during emergencies.

(5) Reporting Problems

Latest data suggest that during FY 80, 81, and 82, Region IV was notified of fewer than 50% of the emergencies which occurred in the eight southeastern states. Although the National Contingency Plan, the National Response Center and the Regional Response Center provide smooth and coordinated mechanisms for reporting procedures, failures in reporting can be attributed to the lack of comprehensive state and local contingency planning. In an attempt to remedy this problem, regional personnel have recently traveled to each state to discuss reporting deficiencies.

Table S-1
Action Taken at Region IV NPL Sites

Site Name	Remedial Investigation	Feasibility Study	Design	Remedial Action
Triana, AL	2	2		
Schuylkill Metals, FL	3	3		
Pickettville Rd. Landfill, FL	1	1	1	1
Davie Landfill, FL	3	3		
Gold Coast Oil, FL	3	3		1
Alpha Chemical, FL	3	3		
SCRDI, Bluff Rd., SC	5	5	5	5
A. L. Taylor, KY			5	5
N. Hollywood Dump, TN	2	2		
PCB Spills, NC	5	5	5	5
Plastifax, MS	1	1		
Mobray Engineering, AL	6	6		
Miami Drum, FL	5	5	5	5
Kassouf-Kimerling, FL	2	2		
Whitehouse Oil Pits, Fl	5	5		
Pioneer Sand, FL	3	3		
Reeves SE Galvanizing, FL	3	3		
Martin Marietta, NC	1	1		
Zellwood G/W Contamination, FL	3	3		
Taylor Rd. Landfill, FL	3	3		
NW 58th St., FL	3	3		
62nd St. Dump, FL	3	3		
Velsicol Chemical, TN	1	1		
Sapp Battery, FL	5	5		
Murray Ohio Dump, TN	3	3		
Coleman-Evans, FL	2	2		
Florida Steel, FL	3	3		
Brown Wood Preserving, FL	6	6		
Hollingsworth, FL	3	3		
Varsol Spill, FL	3	3		
SCRDI, Dixiana, SC	6	6		
American Creosote, FL	4	4		
Sherwood Medical, FL	3	3		
Lee's Lane Landfill, KY	3	3		
Tower Chemical, FL	2	2		
Newport Dump, KY	3	3		
Distler Brickyard, KY	6	6		

Key:
1 - Voluntary Agreement
2 - Compliance Agreement
3 - Pursuing Enforcement
4 - Superfund State Contract (EPA Lead)
5 - Cooperative Agreement (State Lead)
6 - Holding for State Prioritization

Cont'd Table S-1

Site Name	Remedial Investigation	Feasibility Study	Design	Remedial Action
Airco, KY	3	3		
Parramore Surplus, FL	3	3		1
Distler Farm, KY	4	4		
Lewisburg Dump, TN	3	3		
Munisport, FL	3	3		
Carolawn, SC	6	6		
BF Goodrich, KY	3	3		
Galloway Ponds, TN				2
Perdido G/W Contamination, AL	3	3		
Amnicola Dump, TN	1	1		
Chemtronics, NC	3	3		

Key:
1 - Voluntary Agreement
2 - Compliance Agreement
3 - Pursuing Enforcement
4 - Superfund State Contract (EPA Lead)
5 - Cooperative Agreement (State Lead)
6 - Holding for State Prioritization

Table S-2
Matrix of Problems at Region IV NPL Sites

Site Name	Ground Water	Surface Water	Air	Fire & Explosion	Direct Contact	Ranking on NPL
Triana, AL	35.92	100		100		31
Schuylkill Metals, FL	100	21.82			62.5	41
Pickettville Rd. Landfill, FL	100	18.18				45
Davie Landfill, FL	100	4.36				55
Gold Coast Oil, FL	100					56
Alpha Chemical, FL	96.15	5.24				63
*SCRDI, Bluff Rd., SC	61.22	13.99	51.15	63.33	37.5	78
*A. L. Taylor, KY	28.57	10.9				93
*N. Hollywood Dump, TN	26.53	10.9			20.8	94
*PCB Spills, NC	25.27	12.87			87.5	95
*Plastifax, MS	25.13	9.4			29.16	97
Mobray Engineering, AL	92.31	10.06			50	102
Miami Drum,	92.31	8.06				104
Kassouf-Kimerling, FL	89.8	21.82				107
Whitehouse Oil Pits, FL	89.45	14.55				114
Pioneer Sand, FL	88.45	16.08				119
Reeves SE Galvanizing, FL	88.46	16.08				120
Martin Marietta, NC	69.07	57.44				125
Zellwood G/W Contamination, FL	89.8					126
Taylor Rd. Landfill, FL	88.46	8.58				130
NW 58th St., FL	84.62	10.26				144
62nd St. Dump, FL	83.67	14.54			37.5	145
Velsicol Chemical, TN	79.59	21.82			25	158
Sapp Battery, FL	79.59	21.82				160
Murray Ohio Dump, TN	79.59	10.91			37.5	177
Coleman-Evans, FL	79.43	8.58				178
Florida Steel, FL	77.82	16				179
Brown Wood Preserving, FL	76.92	16.78			62.5	183
Hollingsworth, FL	76.92	4.2				193
Varsol Spill, FL	76.92					196
SCRDI, Dixiana, SC	70.0					240
American Creosote, FL	69.23	10.07				243
Sherwood Medical, FL	68.21	9.74			25	255
Lee's Lane Landfill, KY	38.78	10.18	55.38			260
Tower Chemical, FL	64.29	17.52				269
Newport Dump, KY		65.10				291
Distler Brickyard, KY	47.72	7.72	43.59			293
Airco, KY	53.88	28.36				326
Parramore Surplus, FL	58.77	13.43			25	329
Distler Farm, KY	59.18	9.23				339
Lewisburg Dump, TN	56.91	10.49			25	355

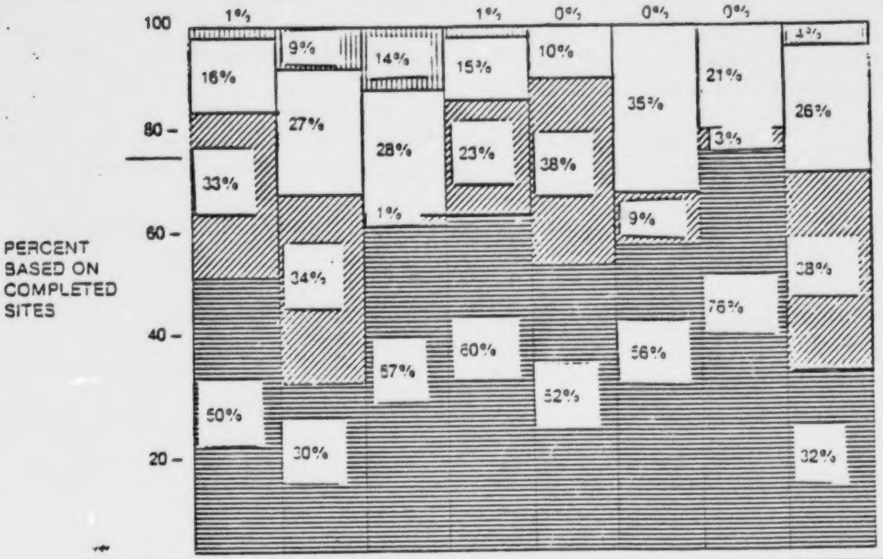
Cont'd Table S-2

Site Name	Ground Water	Surface Water	Air	Fire & Explosion	Direct Contact	Ranking on NPL
Munisport, FL	53.69	15.94			100	362
Carolawn, SC	55.1	6.04				368
B.F. Goodrich, KY	53.88					379
Galloway Ponds, TN	52.35	9.65			37.5	384
Perdido G/W Contamination, AL	52.04	6.18			37.5	394
Amnicola Dump, TN		52.31				397
Chemtronics, NC	51.02	9.65				400

Note: Numbers are based on use of the Hazard Ranking System criteria

*Classified by the states as their number 1 priority.

TABLE A
REGION IV DISTRIBUTION OF PRELIMINARY ASSESSMENTS



STATE	AL	FL	GA	KY	MS	NC	SC	TN	TOTAL
TOTAL P.A.'s COMPLETED	127	176	171	105	85	127	131	189	1111
REMAINING PRELIMINARY ASSESSMENTS	83	21	7	16	16	69	13	12	237

THE ABOVE BAR GRAPH REPRESENTS THE NUMBER OF PRELIMINARY ASSESSMENTS COMPLETED OUT OF THE TOTAL NUMBER OF SITES REPORTED UNDER §103(c).
EACH COMPLETED P.A. HAS AN ESTABLISHED PRIORITY FOR SITE INSPECTION AS FOLLOWS:

- ≡ NO ACTION NEEDED — NO PLANNED INSPECTION.
- ▨ LOW — INSPECTION PLANNED, BUT NO DATE ESTABLISHED.
- ☐ MEDIUM — INSPECTION PLANNED WITHIN ONE YEAR.
- ▥ HIGH - IMMEDIATE INSPECTION PLANNED

Figure S - 1

Reproduced from best available copy.

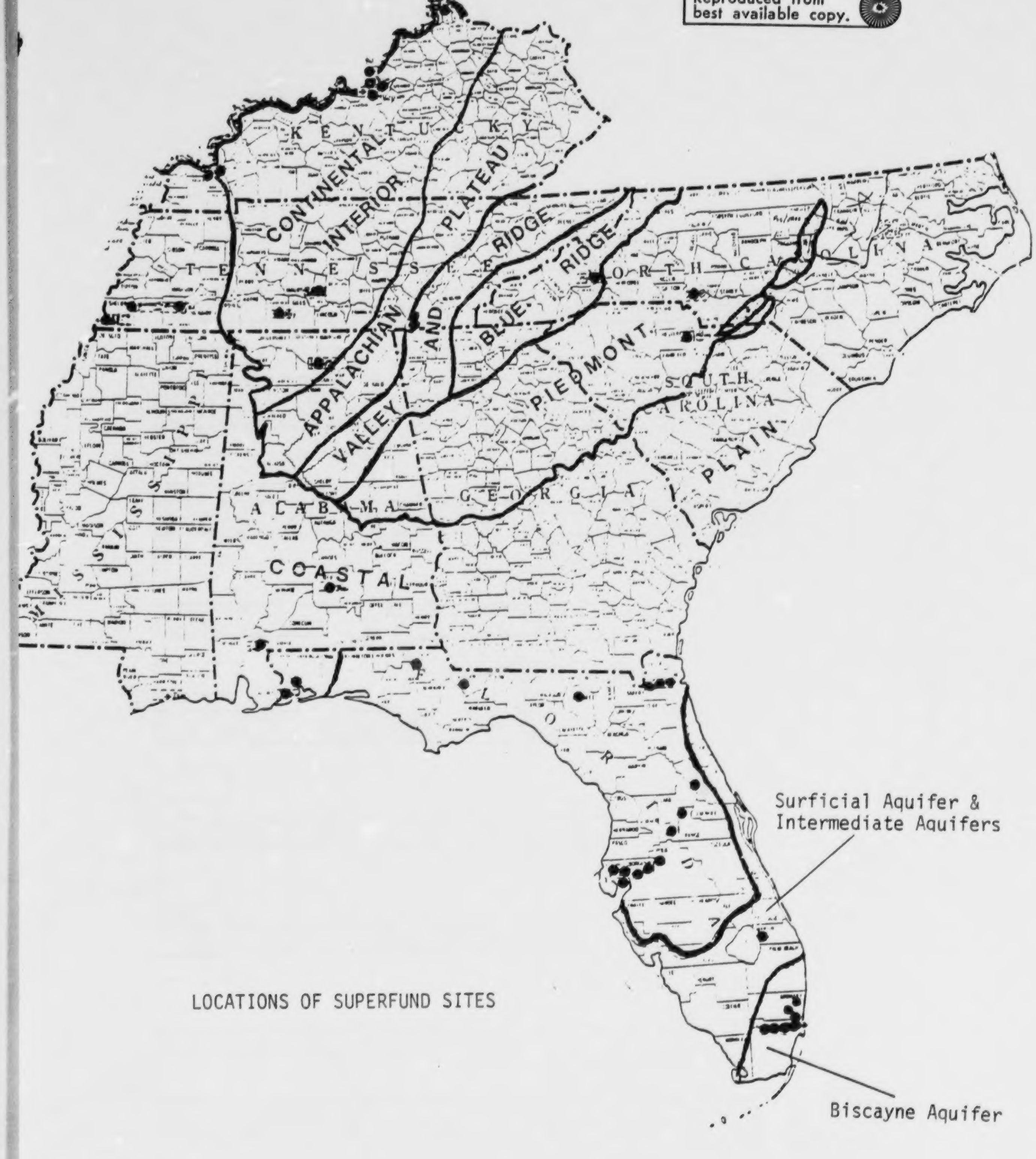

KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
CONTINENTAL INTERIOR
APPALACHIAN PLATEAU
VALLEY AND RIDGE
BLUE RIDGE
PIEDMONT
COASTAL PLAIN
Surficial Aquifer & Intermediate Aquifers
Biscayne Aquifer
LOCATIONS OF SUPERFUND SITES

Figure S-2

NUMBER OF SPILLS REPORTED
TO US-EPA REGION IV

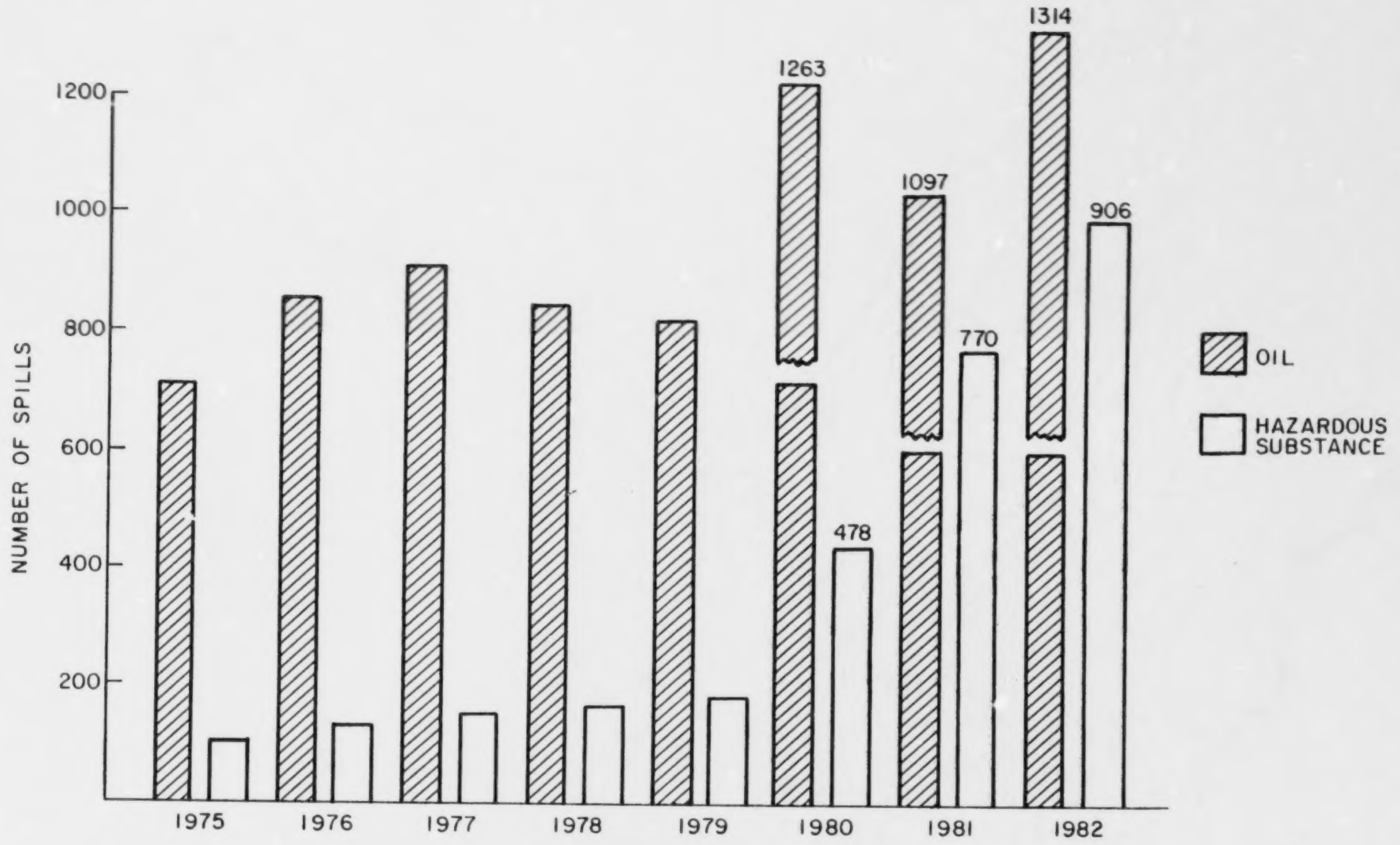
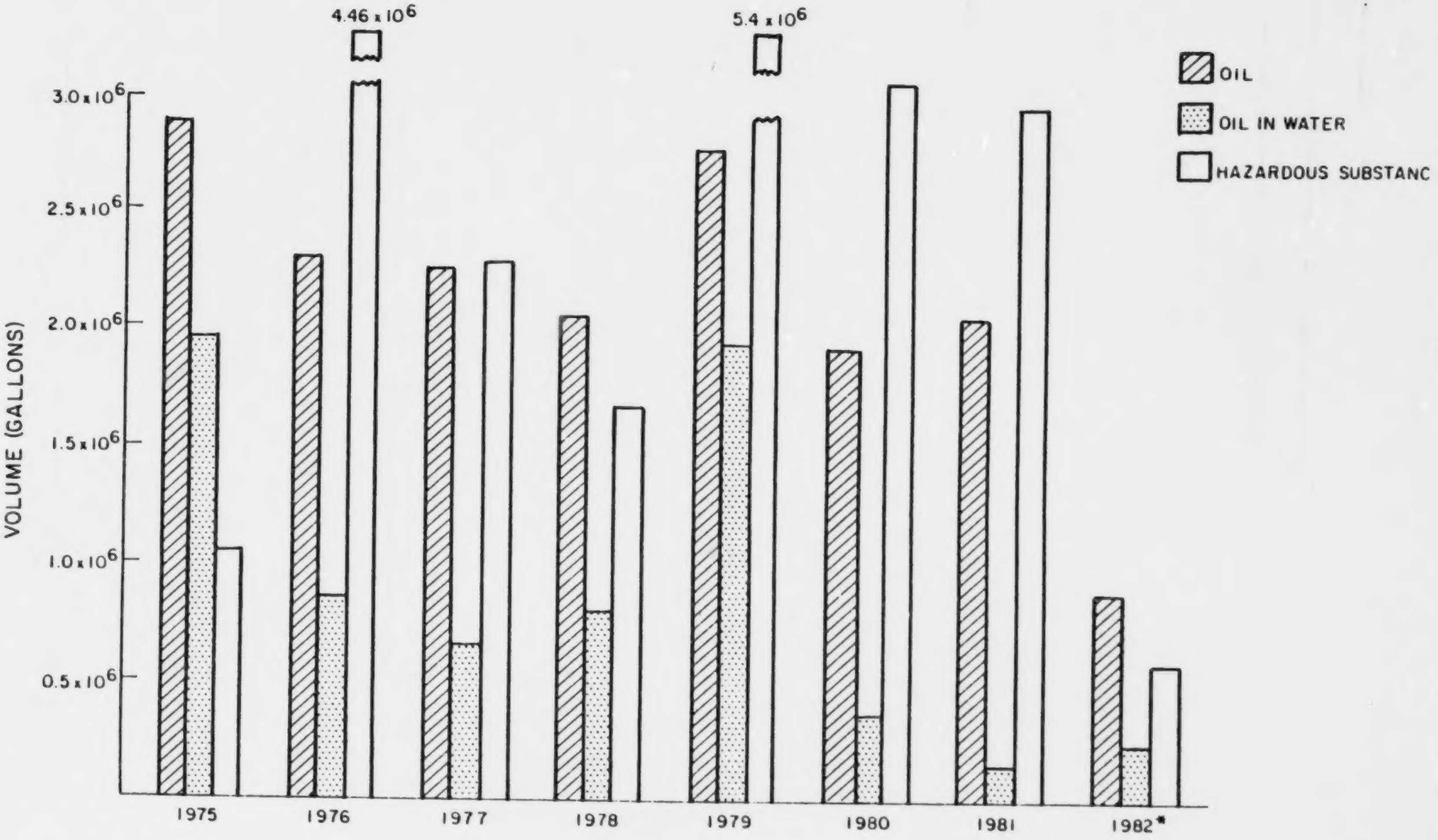


Figure S-3

VOLUME OF SPILLED SUBSTANCES IN REGION IV



(*FOR THREE QUARTERS ONLY)

Figure S-4

MATERIALS REMOVED FROM
IMMEDIATE AND PLANNED REMOVALS
IN REGION IV

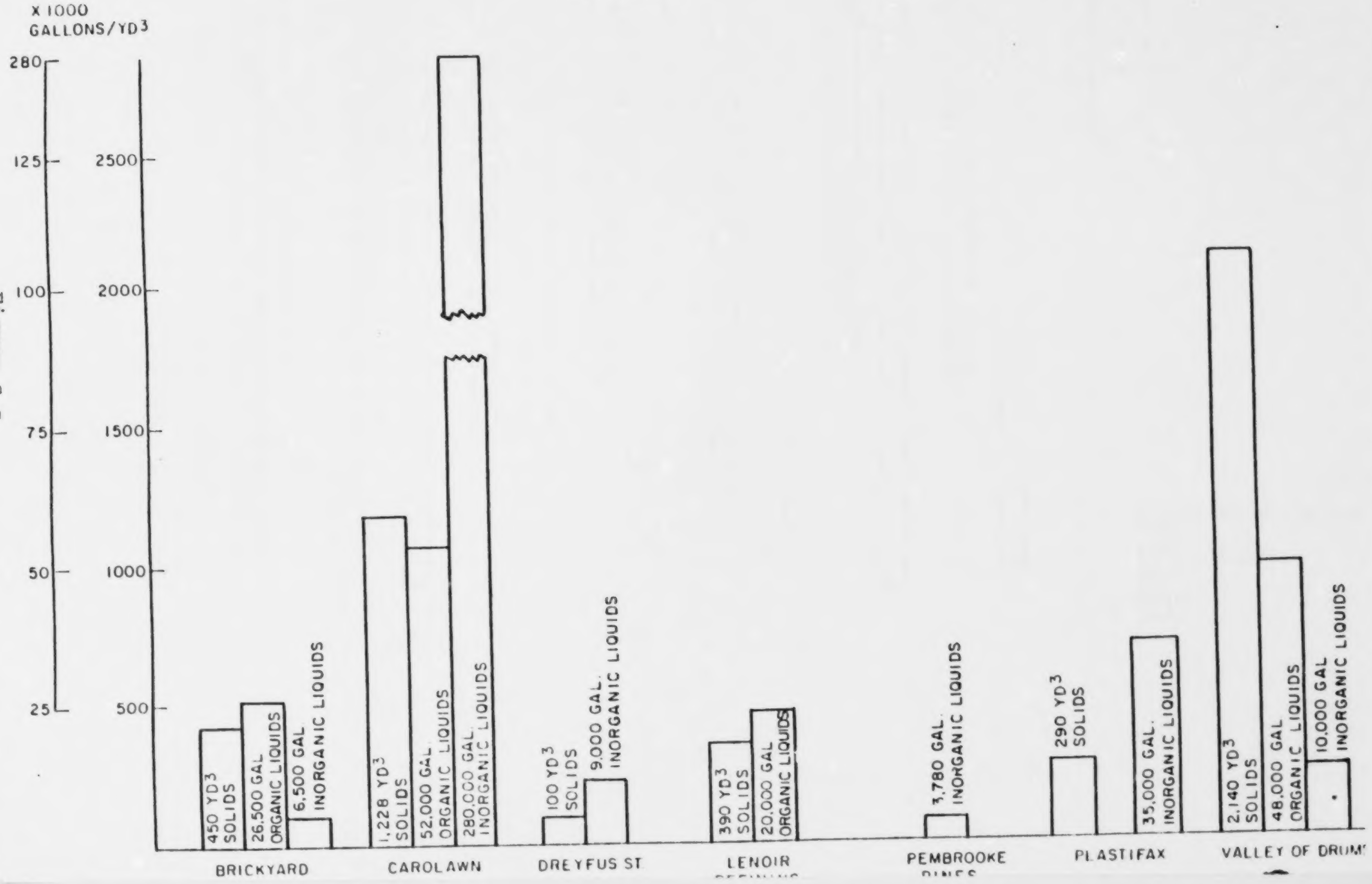


Figure S-5

21 Superfund PERT Charts

AMERICAN CREOSOTE WORKS, PENSACOLA, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
7-82	10-82	2-83	6-83	7-83	2-85	2-85

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
2-85	5-85	6-85	8-85	12-85	2-86

Briefly, the hazard is creosote, pentachlorophenol and wood preserving by-products in the groundwater.

BROWN WOOD PRESERVING, LIVE OAK, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
7-1-83	1-17-83	7-1-83	8-1-83	11-1-83	8-1-84	9-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
9-1-84	11-1-84	12-1-84	2-1-85	2-1-86	5-1-86

Brown Wood Preserving is an abandoned wood treatment plant which used creosote and pentachlorophenol in its processes. Wastewater was stored in a 5 acre surface impoundment. Residences in the area are on private wells which may be subject to an impact.

GOLD COAST OIL, MIAMI, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
	12-82	(Expect generators to do RI/FS)				2-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
2-84	3-84	5-84	1-85	3-85	3-85

Gold Coast Oil was used as a solvent reclamation and bulk storage area from the early 1970's to 1982. Before the July 1982 voluntary cleanup by the property owners, approximately 2,500 corroded and leaking drums were located on the property. Blowdown from past operations sprayed directly on the ground. Approximately 50 drums of contaminated soil were removed. Since only obviously contaminated soil was removed, a thorough evaluation of soil contamination must be done. Further, a FIT team resistivity study identified a plume underneath the property. This needs to be investigated. The site overlies the Biscayne Aquifer, the sole source of drinking water for the area.

HOLLINGSWORTH SOLDERLESS, FORT LAUDERDALE, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
	12-82	11-83	8-83 (g/w)	1-84	12-84	1-85

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
1-85	2-85	6-85	7-85	12-86	8-86

Hollingsworth made electrical terminals. Effluent from their plating (copper, nickel, lead and tin) flowed into a drainfield and contaminated the soil. Some trichloroethylene went into a well into the groundwater. A public water supply wellfield is approximately 1/2 mile away.

MIAMI DRUM, MIAMI, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
		6-2-82	9-29-82	2-83	10-83	11-83

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
11-83	11-83	1-84	3-84	5-85	4-85

Drum recycling company. The county cleaned up the surface drums, etc., and removed the contaminated soil (12-81 - 1-82) at a cost of approximately $1.6 million. A Remedial Investigation is currently underway to determine the type and extent of groundwater contamination.

N.W. 58th STREET LANDFILL, MIAMI, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
				8-82	8-84	12-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
12-84	2-85	5-85	1-86	4-87	4-87

Contamination detected in groundwater plume from landfill. Biscayne Aquifer Study is sampling in that plume. Results delayed by contract labs. When results received, decision will be made on what to do next. Until sampling is complete from Biscayne Aquifer Study, cooperative agreement process will not begin. It is possible that a Superfund cleanup will not be necessary.

SAPP BATTERY, COTTONDALE, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
12-10-81	N/A	4-27-82	6-21-82	12-82	5-84	6-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
6-84	9-84	10-84	1-85	1-86	7-86

Lead and nickel on/in soil, sulfuric acid in surface water as are the lead and nickel. Groundwater not substantiated but possible.

SCHUYLKILL METALS, PLANT CITY, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
7-1-83	12-8-82	8-1-83	9-1-83	12-1-83	9-1-84	10-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
10-1-84	11-1-84	12-1-84	4-1-85	4-1-87	8-1-87

Schuylkill Metals, an active facility, recovers lead from storage batteries. Leachate containing heavy metals and sulfuric acid has been discovered migrating from unlined impoundments into an adjacent drainage ditch. The company has modified its operations to help eliminate some of these problems. The company is being investigated as to its application to RCRA Part B.

TOWER CHEMICAL, CLERMONT, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
3-14-83	1-17-83	5-30-83	6-15-83	7-15-83	2-84	3-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
3-84	3-84	3-31-84	5-84	6-85	9-85

Pesticide manufacturer's poor housekeeping resulted in high concentrations of DDT and other by-products in soil and surface water. Possible contamination of the Floridan Aquifer exists.

VARSOL SPILL, MIAMI, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
			100% Federally Funded	8-82	8-84	12-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
	2-85	5-85	1-86	4-87	6-87

Sampling in suspected area of contamination under way as part of the Biscayne Aquifer Study. Results delayed by contract labs. When results received decision will be made on what to do next.
Until sampling from the Biscayne Aquifer Study is complete it is not certain that Superfund cleanup will be necessary.

WHITEHOUSE WASTE OIL PITS, WHITEHOUSE, FLORIDA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
2-3-82	6-25-82	2-24-82	6-1-82	9-1-82	1-1-84	2-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
2-1-84	4-15-84	5-15-84	7-1-84	5-31-85	N/A

The pits are composed of a waste oil sludge that is toxic to aquatic life and contains several toxic organic compounds. The toxic leachate may cause serious skin irritation because of eroded dikes, and the release of toxic leachate into the surrounding surface waters.

A. L. TAYLOR, BROOKS, KENTUCKY

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
*		5-11-83	7-29-83	8-23-82 FS 3-30-83 GS	4-20-83	5-11-83

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
5-11-83	5-11-83	7-29-83	9-29-83	3-1-84	4-1-84

Substantial volumes of buried waste remain on the site. Surveys estimated that as much as 12,500 cubic yards of material including 18,500 drums may be located in burial areas of the site. Chemical analyses of soil and water takne indicate the presence of a wide variety of organic compounds and heavy metals. Potentially hazardous substances detected included heavy metals, ketones, phthalates, polychlorinated biphenyis (PCBs), chlorinated alkanes and alkenes, aromatics, chlorinated aromatics, and polynuclear aromatics.

* Generator negotiation

DISTLER BRICKYARD, WEST POINT, KENTUCKY

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
9-1-83	3-1-83	10-1-83	11-1-83	3-1-84	11-1-84	12-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
12-1-84	2-1-85	3-1-85	7-1-85	7-1-87	10-1-87

The Brickyard site is an abandoned brick manufacturing facility which was used as an industrial waste disposal area. In February, 1982, EPA removed all drummed wastes, but prior spillage has contaminated the groundwater beneath the site. FIT will install some groundwater wells at the site during March 1983.

DISTLER FARMS, BROOKS, KENTUCKY

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
3-83	11-8-82	4-83	5-83	7-83	2-84	3-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
3-84	3-84	4-84	5-84	9-85	10-85

Unknown number of drums of chemicals to be determined. Thought to be mostly solvents. Danger to groundwater not established by 3/10/83.

LEE'S LANE LANDFILLE, LOUISVILLE, KY

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
9-1-83	12-8-82	10-1-83	11-1-83	3-1-84	3-1-85	4-1-85

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
4-1-85	5-1-85	6-1-85	10-1-85	3-1-88	6-1-88

Lee's Lane Landfill is located along the Ohio River and it received wastes from domestics, commercial and industrial sources. Methane gas was detected in the subsurface, and a gas venting system was finally installed in October 1980. By October 1981, surface drums were pumped out and the liquid disposed of properly. Well drilling is being done to determine groundwater contamination.

PLASTIFAX, GULFPORT, MS

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
8-23-82				(a)10-19-82 (b) 4-15-83	N/A	10-1-83

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
			1-1-84	3-31-84	N/A

* Private response: (a) phase I, (b) phase II field investigation activities only, feasibility study proposed 8-1-83, public meeting under private cleanup not recommended, RIV/RC

**Due to the release of hazardous chemical compounds such as hydrochloric, sulfuric and nitric acids on to the ground surface, environmental contamination of the shallow groundwater and surface soils exists.

N.C. PCB ROADSIDE SPILLS

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
4-23-82		5-7-82	N/A		1-4-79	

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
5-20-82		5-25-82	6-25-82	ongoing	1-26-83 action filed

The intent of this project is to clean up approximately 40,000 cubic yards of PCB (polychlorinated biphenyl) contaminated soils located along the shoulders of 211 miles of North Carolina roadways. The proposed remedial action will accomplish the removal of contaminated soils from along fifteen segments of highway and the placement of these soils in a PCB disposal site in Warren County, North Carolina.

There is a serious need to dispose of the contaminated soils, since PCBs are very stable compounds that will remain unchanged in the environment for an excessive amount of time. Studies using laboratory animals have shown potential chronic effects such as cancer induction, pigmentation, and behavioral changes after ingesting PCBs. Accordingly, the reason for the removal of the PCB contaminated soils to a secure landfill is to prevent the future redistribution of the soils which could increase the chance of PCB exposure to humans and animals.

CAROLAWN, FT. LAWN, SOUTH CAROLINA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
7-1-83	3-1-83	9-1-83	10-1-83	2-1-84	8-1-84	9-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
9-1-84	11-1-84	12-1-84	3-1-85	9-1-85	12-1-85

The Carolawn site is an abandoned waste storage and disposal facility west of Ft. Lawn, SC, that has several hundred drums of chemical wastes, including acids, bases, and organic solvents. Superfund money was used to remove all drums, dispose of all liquids and solids, drain the diked lagoon, and remove the sludge from the lagoon. Possible groundwater contamination needs to be investigated.

SCRDI BLUFF ROAD, COLUMBIA, SOUTH CAROLINA

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
5-6-82	2-16-82		6-28-82	7-83(g/w)	12-83	5-17-82 1-84(g/w)

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
1-84(g/w)			8-83	2-22-83	

The site has an estimated 2300 drums remaining. These remaining drums account for 1/4 of the surficial waste left at the site by a generator sponsored cleanup. Based on the initial findings by the contractor for the generators, the site contains various kinds of explosives and an undetermined number of gas cyclinders.
The remainder of the wastes at the site is presently being cleaned up by a new contractor under a state/EPA Cooperative Agreement. The present contractor (Defender Vac, Inc.) has been on site since 2-22-83. It is anticipated that the present contractor will finish his phase of the cleanup by June 6, 1983.

GALLOWAY POND, GALLOWAY, TENNESSEE

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
3-7-83 Planned Removal	6-1-83	9-1-83	10-1-83	1-1-84	9-1-84	10-1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
10-1-84	12-1-84	1-1-85	4-1-85	10-1-85	1-1-86

The Galloway Pits are a series of old gravel pits used for disposal of municipal and industrial wastes. A company from Memphis is suspected of dumping pesticide wastes in one of the ponds. The types and quantities of waste at this site indicate a potential for groundwater contamination. Governor Alexander has written a letter requesting planned removal.

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

Concurrence of State	RAMP	Action Memo	Coop. Agreement or St. Contract	RIFS	Public Meeting	Decision Memorandum
6-80			8-11-81 (MOU)	12-80	12-79	1-84

Dec. Memo	Action Memo	Coop. Agreement or St. Contract	Design & Construction	Cleanup Documentation	Recovery
1-84	1-84	2-84	6-84	3-80 6-85	

As we can best determine, the N. Hollywood Dump was used for both municipal and industrial waste disposal. At the present time, the true hazards at this site are unknown. However, data is being generated by the TAG to assess the dangers at the site. As it now stands, the data presently being generated will be handed over to a subcontractor who will determine the hazard and subsequently offer corrective alternative measures that will be considered in mitigating any identified environmental hazards.

RADIATION

1. EPA Authority

a. Statutory Authority: AEA 274(h)

Reorganization Plan No. 3 of 1970, 42 USC 202(h), tranferred to EPA the authorities of the Federal Radiation Council, which includes authority to develop guidance for other federal agencies to follow in limiting radiation exposures. Additionally, EPA was given authority, under the Atomic Energy Act, to establish generally applicable environmental standards to protect public health from exposure to radiation. Guidance and Standards being Developed:

(1) Occupational Radiation Exposure

(2) Transuranic Elements Guidance

(3) Radiofrequency Radiation Guidance

(4) Environmental Protection Standards for High-Level Radioactive Waste

(5) Environmental Protection Standards for Low-Level Radioactive Waste

b. Statutory Authority: UMTRCA 206 AEA275/42 USC 2022
CFR: 40 CFR 192

1. Remedial Action Standards for Inactive Uranium Processing Sites

2. Environmental Standards for Active Uranium Mill Processing Sites

c. Statutory Authority: CAA Soc 112/42 USC 7412 CFR 40 61

NESHAPS Airborne Radionuclides - Radionuclides are a hazardous air pollutant. EPA is determining from which source categories of radionuclide emissions create a significant health risk. The Agency will issue standards for each category named.

d. Statutory Authority: SDWA SCC 1412/42 USC 3009-1

Safe Drinking Water Act - The Safe Drinking Water Act of 1974 requires EPA to establish primary and secondary drinking water regulations for public drinking water supplies. Primary regulation are aimed at protecting public health. They establish maximum allowable contaminant levels in drinking water, provide for water treatment technologies, and water supply system operation.

EPA is also developing regulations for clean up and disposal of uranium mill tailing piles under the Uranium Mill Tailings Radiation Control Act of 1978.

2. Region IV Major Radiation Sources

a. Listing

	SOURCE	NO.
(1)	Nuclear Power Plants (Commercial, LWR)	36 (20 operating)
(2)	Research Reactors	3
(3)	Production and Research	7
(4)	Radioactive Waste Burial	2
(5)	Nuclear Fuels Reprocessing	1
(6)	Nuclear Submarine Bases	2
(7)	Phosphate Mining and Milling	2*
		53-Total

*Florida and North Carolina - many large milling operations

b. Discussion

As of December 31, 1982, there were 20 operational nuclear power plants in Region IV with the available capacity of 18,591 megawatts of electrical power generation. This represents 28 percent of the present U.S. capacity of nuclear generated electrical power. The average plant capacity of the operational plants in Region IV is 930 megawatts electrical, with a range of 728 to 1220 megawatts electrical for the individual plants.

There were 16 nuclear power plants, under construction as of December 31, 1982, in Region IV. These plants will provide an additional available capacity of 17,707 megawatts of electrical power generation. The average plant capacity of the plants under construction is 1,107 megawatts of electrical power generation. Also, as of December 31, 1982 there was an additional plant capacity of 5,036 megawatts electrical power on order by utilities in Region IV with an indefinite status for construction and operation.

3. Fundamental Issues

a. Waste Management:

At the present time, there are only three burial facilities in the United States that are utilized for low-level radioactive waste disposal: Barnwell, South Carolina; Richland, Washington; and Beatty, Nevada. Because of the shortage of disposal capacity and the lack of national policy, Congress passed the Low-Level Radioactive Waste Policy Act in December, 1980. The Act encourages states to form regional compacts to manage low-level wastes. It further provides that a host-state burial facility can exclude the receipt of any waste generated outside a regional compact after Januray 1, 1986.

A Southeast compact is under development with the states of Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. The present compact language provides for the use of the Barnwell, South Carolina burial facility until 1992 at which time it will be closed. The intent of the Southeast compact is to have another site operational by that date to serve the regional party states. Wastes generated by federal government defense, research, and development activities are not included as state responsibilities under the compacts.

The proper management of Low-Level Radioactive Waste (LLW) has become a major concern of governmental agencies. This intense interest has been exhibited by the public in general, by the Congress through the introduction of various bills relating to LLW, and, in particular, by the passage of the Low-Level Waste Policy Act of 1980.

Intense interest in LLW issues has been generated in individual state and local governments as existing commercial sites begin to close or reduce the volume of waste being accepted. This situation, which became critical in 1979-1980, has made government officials and waste generators recognize the potential unavailability of facilities to dispose of their radioactive waste, and the consequences that would result.

The major environmental concern is the potential for radionuclide contamination of man's environment from disposal of such waste, and, in particular, groundwater contamination at the state and local community level. Safeguarding the public health by protecting the quality of groundwater, and in turn the radiological (DWS) quality of surface water, especially during low-flow periods, is dependent upon groundwater quality protection. Another major concern is the potential nonavailability of shallow land burial sites for disposal of the wastes, which would significantly curtail, if not prohibit, the beneficial use of radioactive material.

Problems have occurred at most existing sites. One of the major causes for these problems has been the lack of national criteria and guidelines in the proper design and operation of shallow land disposal sites. For future sites for disposal of LLW - without clear, comprehensive and nationally accepted criteria, standards and guidelines - decisions will be fragmented, nonuniform, and will probably result in much slower desicion-making processes for the proper management of Low-Level Radioactive Waste.

b. Spent Nuclear Fuel Storage

Operating commercial nuclear power plants have the primary responsibility for providing interim storage of spent nuclear fuel by maximizing to the extent practical, the effective use of existing storage facilities on-site and by adding new on-site storage capacity. This is being accomplished through the use of high-density fuel storage racks, fuel rod compaction, and the transshipment of spent nuclear fuel to another power reactor within the same utility system. Also, the construction of additional spent fuel pool or dry storage capacitiy, or other storage means at the sites of nuclear power plants is often needed to assure the continued orderly operation of the reactors to supply base load electrical power generation.

Under the Nuclear Waste Policy Act of 1982, the federal government has the responsiblity to provide up to 1900 metric tons of capacity for interim storage of spent nuclear fuel for the commercial power reactors that cannot reasonably provide adequate storage capacity on-site when needed to assure the continued orderly operation of power generation.

In conjunction with DOE actions to alleviate the spent nuclear fuel storage problem under the Nuclear Waste Policy Act of 1982, EPA has the responsibility to set generally applicable environmental radiation standards for radioactive wastes. In December 1982, EPA issued proposed Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Wastes under 40 CFR 191.

c. Radiation Emergency Planning and Response

The air, water, drinking water, and toxics acts all have emergency sections which give EPA authority to deal with immediate dangers to the public, including exposure to radioactive materials. EPA may issue orders and file for injunctions to regulate any emission, storage, transport, or other activity posing an imminent and substantial danger to public health.

Specifically, the Agency is charged with the following responsibilities:

- Identifying and diagnosing radiological hazards in the environment as a result of an accident.
- Assisting in the development and coordination of federal, state and local plans to prevent or minimize long-term ecological impacts from emergencies and to preserve resource quality during an emergency.
- Developing protection action guides for use in emergencies which would estimate radiation doses which may result from radiation incidents and recommend specific emergency actions.

The Region IV Environmental Radiation Program is a charter participant in the Federal Interagency Radiation Emergency Radiation Assistance Committee. The committee is chaired by the Federal Emergency Management Agency (FEMA) and also includes the Nuclear Regulatory Commission (NRC), the Department of Transportation (DOT), the Food and Drug Administration (FDA), the Department of Energy (DOE), and the Department of Agriculture (DOA). State and county emergency plans are reviewed and exercises of those plans are evaluated by representatives of the federal agencies, with written comments submitted. The EPA representatives particularly evaluate how the EPA protection action guides are implemented.

The Three Mile Island accident was a unique event in the context of emergency management. The conditions it imposed were new and there was inadequate understanding of potential radiation amounts and effects, and there were problems in understanding the technology of events transpiring at the site. These factors have been addressed at the federal, state and local events in present emergency response plan development so that future emergency conditions at fixed nuclear facilities will adequately provide for the risk to health and safety of the public. The federal responsibility mandates a level of emergency planning and coodination that will meet the strictest guidelines, to provide timely, clear-cut guidance applicable to state plans and to give needed support to states in the event of an evacuation or protection action. The states should rely on continually updated plans for at least a ten-mile radius for all fixed nuclear sites.

All Region IV states now have Radiation Emergency Response Plans and all plans have been exercised at least once. The large number of radiation sources in Region IV add considerably to this workload.

d. Phosphates

Phosphate lands are located in large areas of central Florida and the coastal areas of South Carolina and North Carolina. Containing Radium-226, they are a source of increased exposure to radiation for area residents, and thus, an increased risk of developing cancer. Such risks exist in undisturbed phosphate lands and in mined phosphate land, both reclaimed and unreclaimed.

Radon, a radioactive gas, is emitted by Radium-226 in the soil and may seep through the foundations of houses. If present in sufficient concentration, it can produce carcinogenic effects in people residing in those houses. EPA has developed remedial prevention techniques for controlling radon, including both structural and in-house reduction methodologies.

In the future, the EPA Region IV office, in conjuntion with EPA/ORP Headquarters, will continue to work with the states in the interpretation and implementation of the EPA radon exposure recommendations and remedial prevention techniques.

4. Primary Sites Using Radioactive Materials

a. Savannah River Plant

The Savannah River Plant (SRP) facilities were established in the early 1950's to produce nuclear material for national defense requirements, principally plutonium and tritium. The site is 150 kilometers (94 miles) from Savannah, Georgia, on an 800 square kilometer controlled area along the Savannah River in South Carolina. The major operating facilities include three isotope production reactors, two chemical separation plants, a fuel and target fabrication plant, a heavy water production plant and the Savannah River Laboratory. These facilities are the principal sources of radioactive liquids and airborne emissions.

Since opening, SRP has generated more than 265,000 cubic meters of high level radioactive liquid waste, and continues to generate between 5,700 and 7,600 cubic meters per year. The volume is being reduced by more than 60 percent through evaporation. The waste is stored in tanks underground with capacities for 2,800 to 4,900 cubic meters. From 1966 to 1982, DOE has constructed 27 high-integrity, double-shell storage tanks to replace the older tanks, and to store new waste. This construction was completed in

1982. These tanks have a combined capacity of 132,000 cubic meters. The high-level waste is being transferred from the old tanks to the new tanks and prepared as feed material for the Defense Waste Processing Facility (DWPF).

The DOE plan is to remove the waste from tanks, immobilize it, and dispose of it in an off-site geologic repository. Borosilicate glass was selected as the waste form in 1982. The current engineering projections for the DWFP are to process about 1250 cubic meters of sludge and produce approximately 500 canisters of borosilicate glass per year.

The SRP also generates about 10 percent, by volume, of the defense transuanic (TRU) waste. This share is envisioned to increase to about 15 percent by 1989-90.

In August 1982, DOE issued an Environmental Assessment on the proposed restoration and operation of the L-Reactor at SRP. DOE issued a FONSI indicating that an Environmental Impact Statement would not be required, as the restoration of L-Reactor was not a major federal action. In this report, DOE acknowledges there are environmental issued related to:

a) Cooling water withdrawal, including increased usage from the Savannah River and increased impingement and entrainment of fish, b) thermal discharge as a result of heated effluent to be discharged directly to Steel Creek, c) floodplain/wetland impacts of direct discharge of cooling water to Steel Creek, which has been undergoing post-thermal recovery since 1968, d) 1000 or more acres of wetlands of Steel Creek and Savannah River are impacted, and additional wetland habitat is expected to be eliminated or modified at the rate of approximately seven to ten acres per year, e) Radiocesium transport and remobilization in the Steel Creek - Savannah River System, and f) Radiological dose commitments to the public.

Should the determination be made that this is a major Federal action significantly affecting the human environment, an Environmental Impact Statement (EIS) should be prepared. The purpose of the EIS is to fulfill the requirements under Section 103 (2) (c) of the National Environmental Policy Act of 1969 (NEPA), by providing environmental inputs to the decisions regarding the proposed action and its reasonable alternatives.

This is not a new source, much operational data are available, and the cumulative radiological impact, including the radiocesium transport in the liquid pathway, has been studied extensively. The radiological impacts of the proposed action are based on projections of the current operational releases on the environmental baseline. The environmental assessment provides the maximum individual and population dose commitments resulting from radioactive releases from the L-reactor and its supporting facilities.

This issue must continue to be monitored by the Region IV Environmental Radiation Program as well as the impact of new facilities which are under consideration for construction within the Plant complex.

EPA Region IV testified before the Senate Armed Services Committee February 9, 1983 regarding environmental impact issues, danger or hazards to the public from the restart of the L-reactor.

b. Maxey Flats Low Level Radioactive Waste Disposal Facility

Maxey Flats, which was established in 1962, was initially plagued by poor management and poor operation. Current hydro-geological knowledge of the site is insufficient to develop a model capable of predicting future ground water behavior. The primary radiation control problem at the site involves water management, which includes carryover into the Evaporator Stack Effluent and surface transport of radioactive liquid.

Most of the waste disposed of appeared to be readily degradable and poorly packaged so that large voids existed or developed between the waste and packaging. Contact with water caused additional voids. This led to settlement of the trench contents followed by slumping and subsidence of trench covers. This in turn allowed enhanced percolation of water through the trenches.

In addition, control of liquid accumulation in the trenches constitutes a major problem and expense. The site evaporator has been operating since 1973 with the processing rate of contaminated liquid exceeding the accumulation.

Basic work to accomplish eventual decommissioning of the site is in progress. The old tank farm and the small pond, both areas for accumulation and contamination of rainwater, have been eliminated, and water infiltration into the trenches has been diminished by the re-working of trench covers, recontouring, drainage improving, and the protection of some 20.5 acres of trenches by plastic cover. The evaporator will continue to be operated through at least 1983 due to the backlog of contaminated water onsite.

An EPA/ORP study on the Maxey Flats operations was conducted with a report issued in January, 1976 which focused on waste management and migration of radioactive materials at the site. The concern is with any insult to the environment outside of the plant boundaries and availability of technical assistance to the state should such be requested. Surveillance of the site by the state and analysis of the environmental data by appropriate organizations will be necessary in the foreseeable future.

c. Oak Ridge Nuclear Facility (DOE)

The Oak Ridge DOE Reservation is located in northeastern Tennessee, approximately 35 kilometers west of Knoxville, Tennessee. It is in a valley between the Cumberland and Great Smokey Mountains and consists of aproximately 150 square kilometers. The major facilities at the Oak Ridge site include the Oak Ridge National Laboratory (ORNL) which is a multi-discipline research laboratory with nuclear research reactors, chemical pilot plants, research laboratories, radioisotope production laboratories and support facilities including the High Flux Isotope Reactor and the Transuranic Processing Plant. About one percent of DOE's Transuranic (TRU) waste is produced and stored annually at ORNC.

d. Oak Ridge Gaseous Diffusion Plant

This consists of a complex of production, research, development and support areas to provide enrichment of the Uranium-235 isotope. Still another major facility is Oak Ridge Y-12 Plant which has four primary purposes: (1) production of nuclear weapon components; (2) fabrication support for weapons design; (3) support for the ORNL; and (4) support and assistance to other government agencies. Smaller facilities located at the reservation are the comparative animal research laboratory and the Oak Ridge associated universities.

The primary areas of environmental concern at the site include radioactive airborne emissions, on-site radioactive waste disposal areas, the impact of radioactive material released in the liquid effluent (White Oak Creek to the Clinch River to the Tennessee River), and dredging operations in preparation for the construction of the Clinch River Breeder Reactor at Oak Ridge, TN.

Radioisotope concentrations in the Clinch River are within the allowable limits of the EPA drinking water standards. A substantial amount of the radionuclides are absorbed by the river sediments and transported by diffusion, with sufficient dilution as to present no significant health risks to off-site individuals and populations. EPA, in conjunction with DOE and the state of Tennessee, will continue to monitor Oak Ridge's operation for any off-site environmental impact which may affect the public health and safety.

The Clinch River Breeder Reactor Plant (CRBRP) is the demonstration project proposed by DOE (TVA and nuclear industry participation) under its Liquid Metal Fact Reactor Program. The licensing activities were suspended in 1977 but resumed in September, 1981. The 1981 total plant cost estimate was about $3.2 billion dollars. EPA has been involved with this project since the early 1970's to assist DOE under the authority of the Second Memorandum of Understanding between EPA and NRC regarding implementation of certain NRC and EPA responsibilities (Federal Register 40 40115) pursuant to NEPA regarding issuance of licenses for nuclear power plants and certain other facilities.

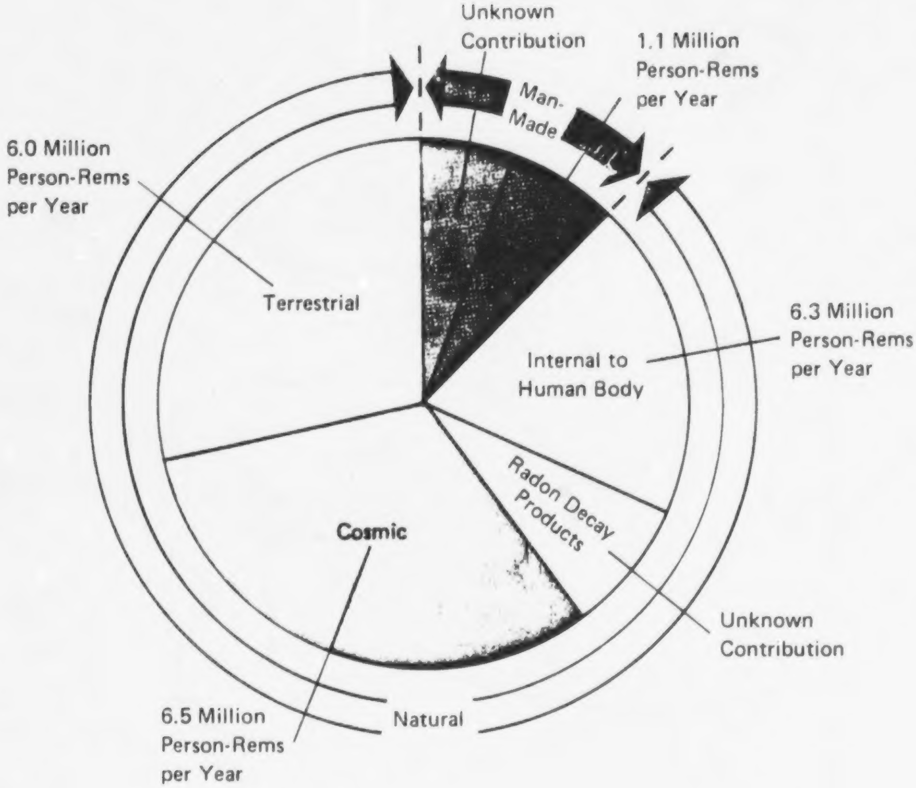
Since the FEIS was issued in 1977, additional data relative to the site and its environs have been collected, several modifications were made to the plant design and its fuel cycle and the timing of plant construction and operation have been affected. NRC and EPA summarized these damages, and their environmental significance was assessed the in the July, 1982, draft supplement to the 1977 FEIS. In December, 1982, Region IV issued to all interested agencies, public groups and citizens the Record of Decision on the CRBRP and Notice of NPDES permit determination for the proposed DOE demonstration project. The agency's decision and summary of its EIS (CAA Section 309) review responsibility was presented. The mitigative measures adopted to minimize adverse environmental effects of the action were identified. Region IV will continue to cooperate with NRC as the lead agency on the NEPA issues, and assist DOE with their implementation actions during proposed construction and operation of the CRBRP.

e. Kings Bay Submarine Base

In 1977 the Department of Defense (DOD) and the U.S. Navy proposed major federal action for the construction and operation of a fleet ballistic missile submarine support base at Kings Bay in Camden County, GA. Disclosure of the project description, existing environmental base, probable impacts and mitigating measures, and alternatives to the proposed action were presented in a DEIS. The Navy recognized that the establishment of the Kings Bay Submarine Support Base, expandable to become the major East Coast future Trident base, involved a complex, interactive relationship in the environment. EPA Region IV, the state of Georgia, in conjunction with the Navy, planned a preoperational radiological baseline to measure all important components of the background radioactivity currently present at Kings Bay site beginning in May 1978. EPA participated in the monitoring survey, and performed laboratory analysis of duplicate sites of environmental samples. Air, soil harbor water, groundwater, harbor sediments and core samples of the St. Mary's River proposed turning basin areas, adjacent (marsh) wetlands, marine life and Cumberland Island shallow water areas were included in these samples. Results of the monitoring survey were published by Navy, EPA, and the state of Georgia (DNR). Quality assurance of the radiological data base was enhanced by the individual laboratory analysis.

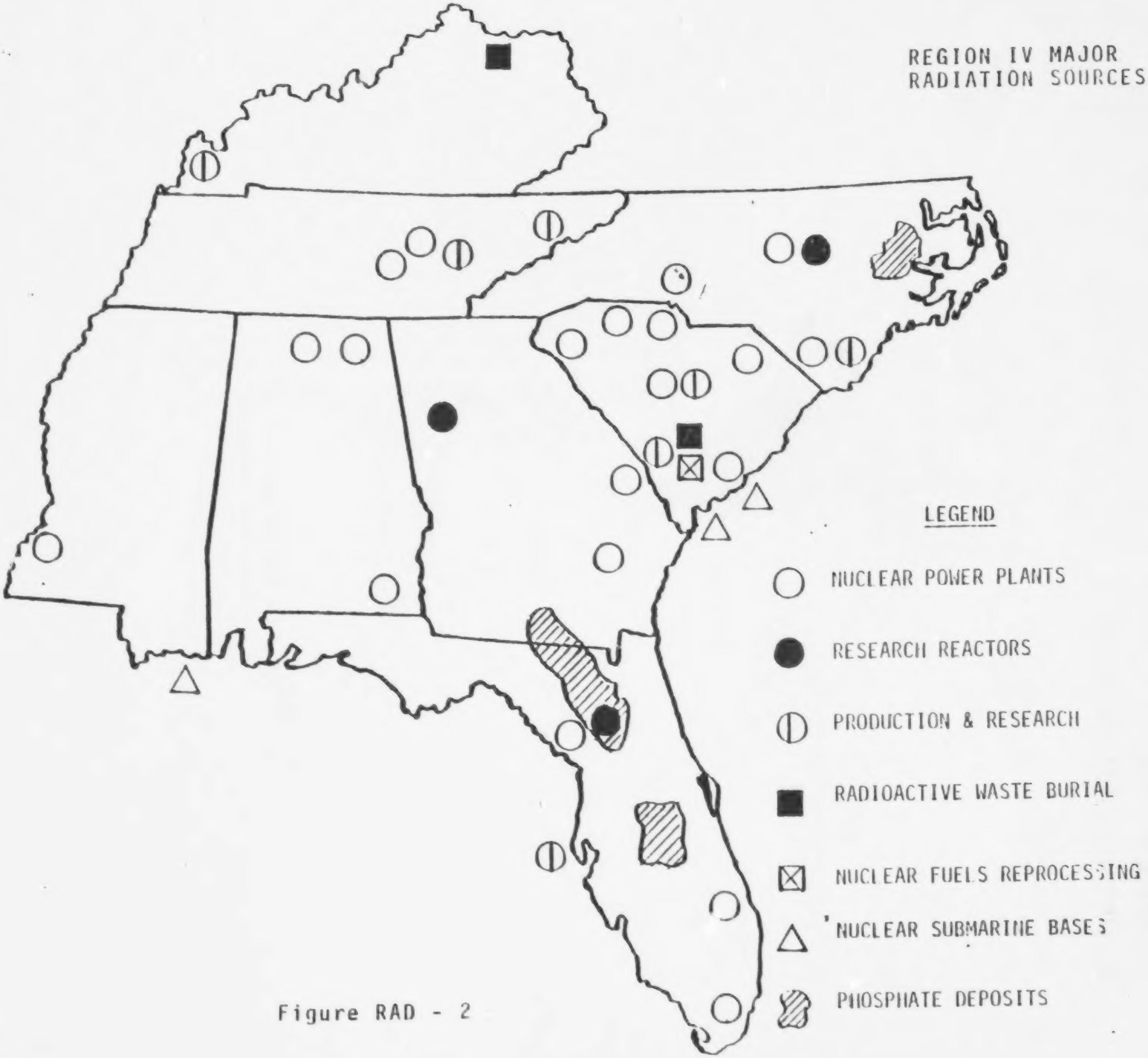
The Department of Defense, under the present administration, envisions up to 20 Trident class submarines to be based at the Kings Bay site. The state of Georgia (DNR), Environmental Protection Division, is continuing with the operational monitoring program under the state Fixed Nuclear Facility Environmental Radiation Surveillance Program. EPA is providing technical assistance and monitoring equipment to DNR, quality assurance crosscheck, review of the surveillance monitoring data, and cooperation with the federal facilities' regional coordinator to assure that any off-site environmental radiation impacts are minimized.

Exposure From Environmental Sources



Sum of Known Environmental Sources
is 19.9 Million Person-Rems per Year

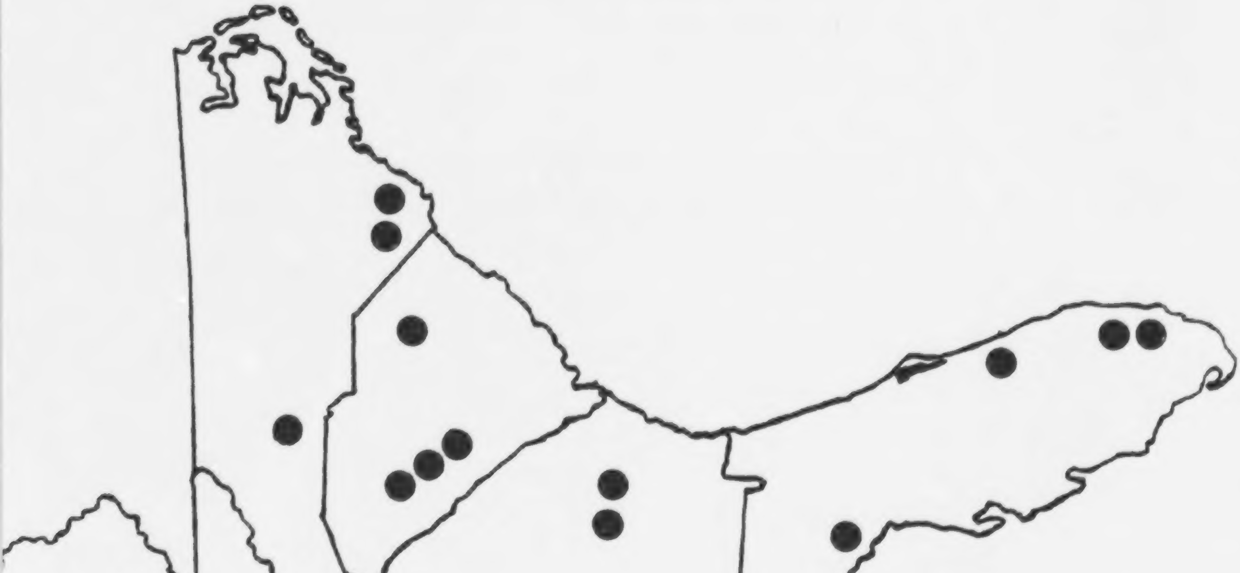
Figure RAD - 1



REGION IV MAJOR
RADIATION SOURCES

LEGEND
○ NUCLEAR POWER PLANTS
● RESEARCH REACTORS
⦶ PRODUCTION & RESEARCH
■ RADIOACTIVE WASTE BURIAL
☒ NUCLEAR FUELS REPROCESSING
△ NUCLEAR SUBMARINE BASES
▨ PHOSPHATE DEPOSITS

Figure RAD - 2



Operating Nuclear Power Plants

Figure RAD - 3

LOW-LEVEL RADIOACTIVE WASTE

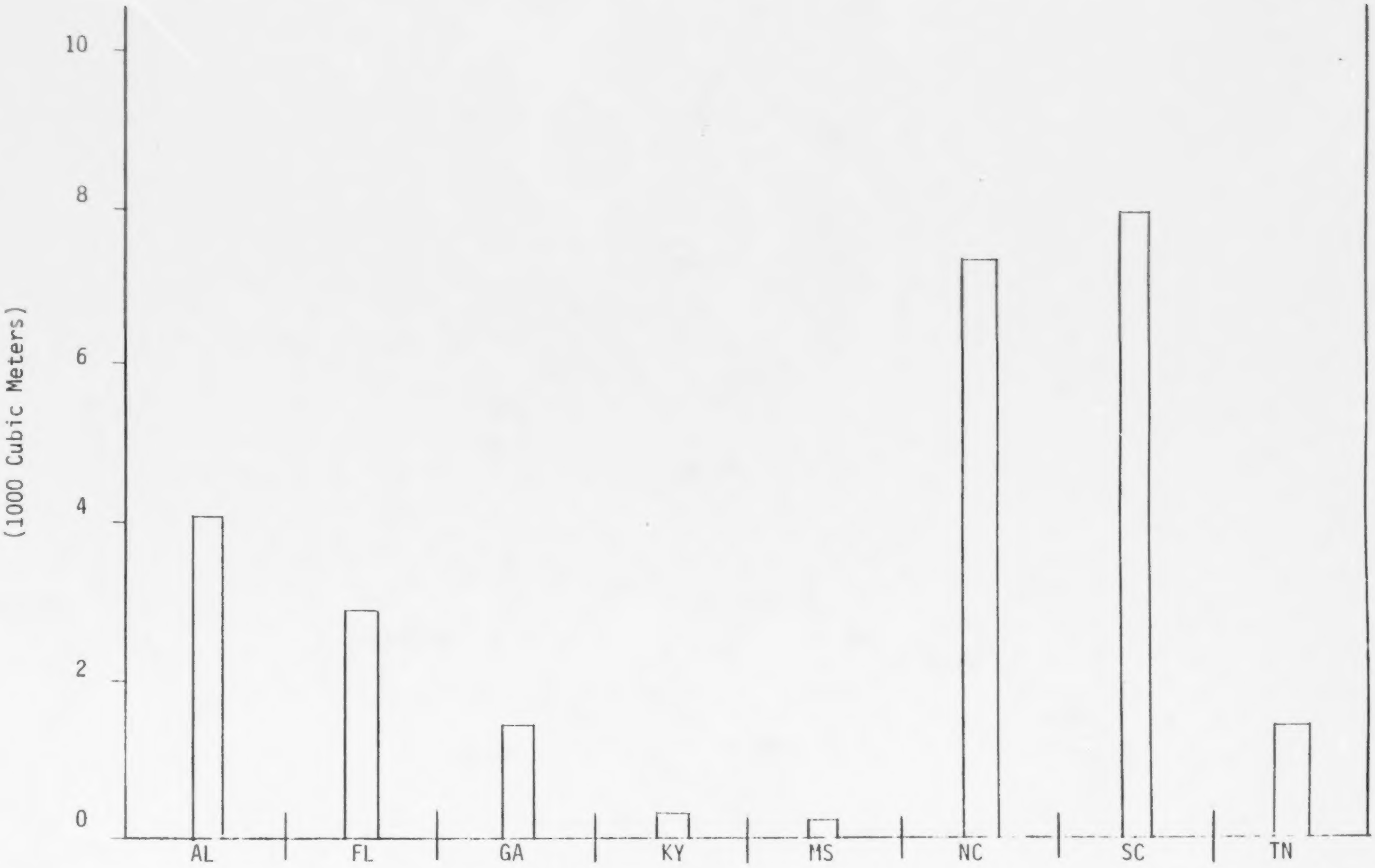


Figure RAD - 4

PESTICIDES

1. Overview of Status and Trends

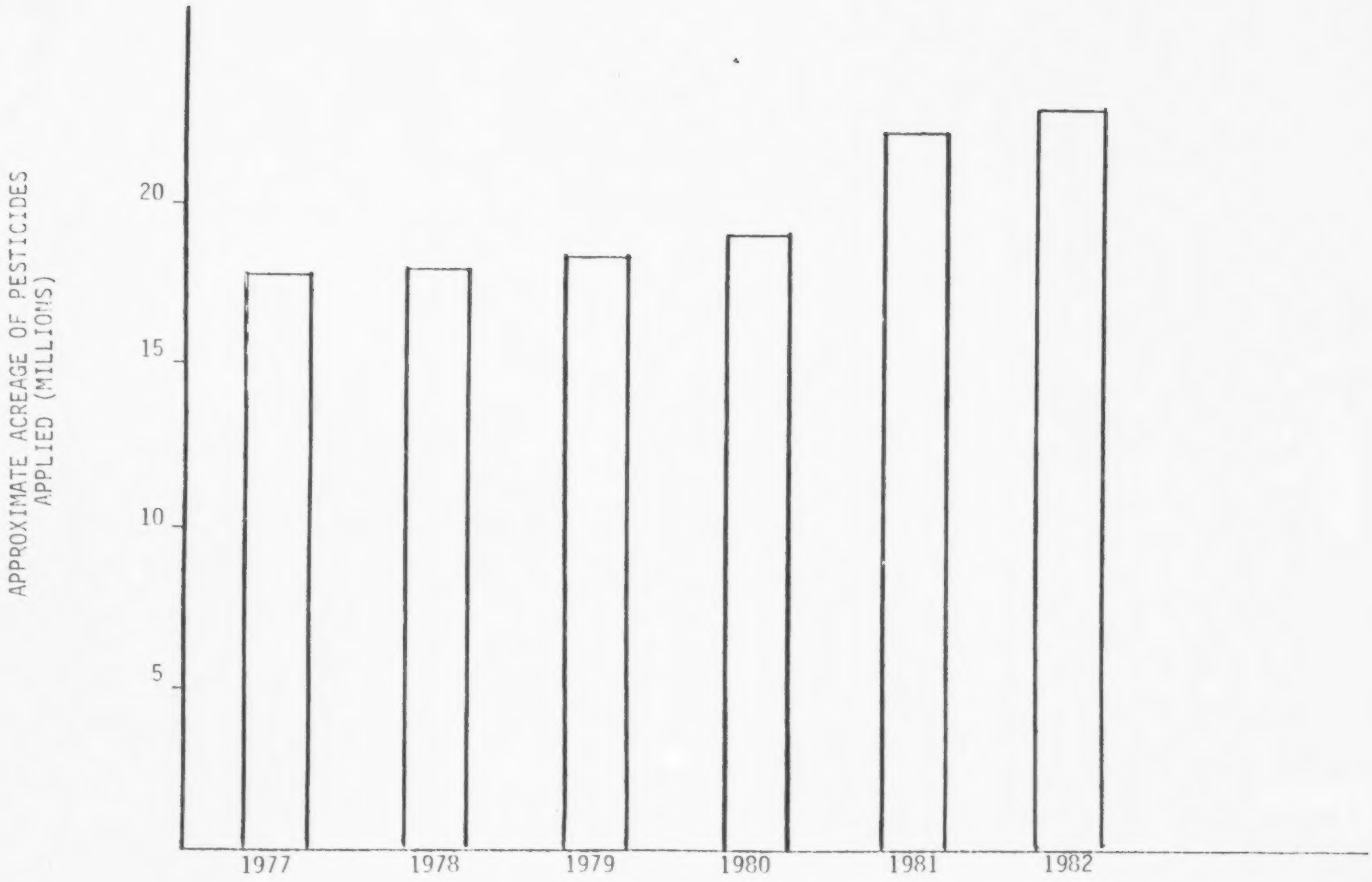
The use of pesticides (both insecticides and herbicides) is proportionately greater in the South than other areas of the country. By the mid-to-late 1970's the South accounted for nearly sixty-six percent of the 86 million pounds of insecticides, and twenty six percent of the 98 million pounds of herbicides, used nationally. Attendant with this significant use are the potential problems of residues of pesticides in food commodities and groundwater, as well as bioaccumulation (real or perceived) resulting from the persistence of certain of these chemicals.

The percentage use of chemicals is not expected to decrease in the future since the Region contains more than one fourth of the total number of farms in the United States and the number of acres to which pesticides are applied continues to increase (Figure P-1). In addition, some 300,000 private and 50,000 commercial applicators in the Region hold valid certification, and are all potential sources of continuing future pesticide application.

While it may be tempting to visualize the magnitude of the problem by tracking the actual pounds of pesticides applied, the introduction of new chemical compounds has made such an analysis misleading. New chemicals such as synthetic pyrethrin require a much lower volume of application, and hence the loading to particular acreage may be reduced. However, the actual number of acres to which pesticides are applied is increasing as demands for crop production cause more land, presently in unmanaged forest and rangeland, to be converted to intensively managed cropland.

Managing the pesticide program (registration, training, inspection, investigation and enforcement) to minimize the risk and increase the benefits of pesticidal use is a challenging job. Pesticide poisoning cases involving children are one of the documented risks (Figure P-2). The switch from long-lived chlorinated hydrocarbons to shorter-lived substitutes with greater acute toxicity to people has aggravated this problem, and demonstrates the need for greater safety consciousness among the general public (pesticide applicators in particular). This is one of the challenges for the future.

PESTICIDE ACREAGE



DATA FOR THE STATES OF AL, FL, KY, MS, & SC

Figure P - 1

CHILDREN 0-14 YEARS OF AGE
REGION IV STATES

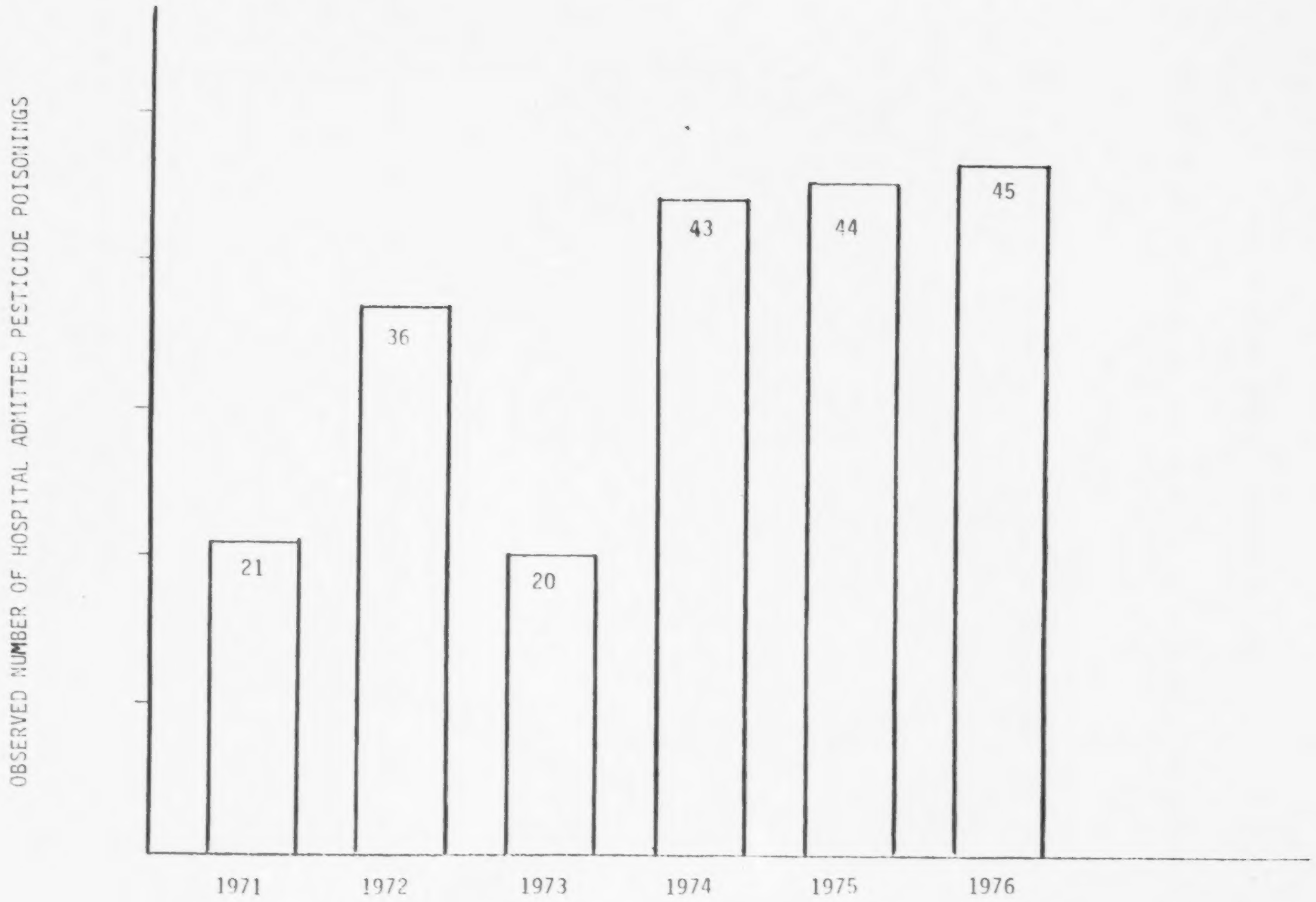


Figure P - 2

Region IV
ENVIRONMENTAL MANAGEMENT REPORT
Pilot Project
Attachment B
Detailed Analysis of Significant Environmental Problems and Special Projects

AIR QUALITY

1. There is a rising public concern and awareness regarding the impact of pollution (air, water, hazardous waste, etc.) on our lives. The need exists to identify those problem areas, understand the causes, and ultimately establish measures to eliminate these concerns. There are numerous nonattainment areas in the Region for total suspended particulate, ozone, carbon monoxide, and sulfur dioxide, that will require a concerted effort by Federal, State, and local control agencies to resolve the environmental problems. This Region has identified five (5) geographical locations with nonattainment problems in which a detailed analysis of the problem should be addressed. These areas are: (1) Ashland, Kentucky; (2) Birmingham, Alabama; (3) Southeast, Florida; (4) Louisville, Kentucky; and (5) Knoxville, Tennessee. Addressing these environmental concerns in these areas may give insight to help solve the many other nonattainment areas in the region.

In addition, thoughout Florida there is a growing desire of power companies to convert power plants from oil to coal. The impact of increased air pollutants from these conversions could be significant. This concern will be addressed in this appendix also.

a. Ashland, Kentucky - Total Suspended Particulates (TSP) Nonattainment

Ashland, Kentucky is a highly industrialized nonattainment area for particulate emissions and the state's submitted SIP revision does not demonstrate attainment by the statutory attainment date. The area is on the Tier II list of areas subject to sanction. The Ashland area has four monitoring sites which are exceeding the primiary (health-related) National Ambient Air Quality Standard (NAAQS) for particulates. The most recent year with complete data available is 1981; the annual geometric means were 100, 77, 87, 94 ug/m^3 at the four sites. The primary NAAQS for particulate is 75 ug/m^3. These values appear to be fairly stable over the past three years, although the maximum 24 hour averages have decreased. The state feels that fugitive dust emission from unpaved roads may be the major contributor to the TSP nonattainment problem.

Because Ashland has continued to exceed the NAAQS for TSP for the past ten years and the areas's air quality appears to have stabilized but is still nonattainment, it has been selected by the Region to be the subject of a pilot audit program for environment results. The Ashland area has several advantages over other TSP nonattainment areas in the Region for this type of program. For example, the nonattainment area is reasonably small in size; the source inventory is small enough to be manageable; and historical ambient data is available back to 1965. The pilot audit program will be designed to determine the magnitude, possible causes of the particulate problem, and potential solutions. The audit will address considerations such as siting and operation of monitors, nearby source emsission and their degree of control, compliance with regulation, and operating characteristics. Fugitive dust emission from unpaved roads will be addressed as part of the program audit, and new source growth impact will be considered when formulating final corrective action.

The study will require the efforts of several program groups within EPA, cooperation by the affected community, and the services and expertise of an outside contractor. EPA's activities will include: (1) conducting emissions inventories for ther study area; (2) identifying all violating facilities; (3) profiling the chronology of abatement equipment installation; (4) providing a meteorological profile of the Ashland Area; (5) conducting air quality modeling; (6) developing a microinventory of each monitor; (7) evaluating the Ashland ambient monitoring sites and (8) recommendation for additional contacts. Regional Counsel's Office will be required to provide legal services regarding confidentiality of the data obtained during the study. The contractor will need to provide approximately 1600 manhours.

Based on the audit results, the Regional Office and State will formulate corrective actions for the major problems. These actions could include, but are not limited to: (1) enforcement in the case of violations of emission limits in the vicinity of the ambient violations; (2) improved regulations on source operation or emission limits that would have to be included in SIPs as a regulatory revision or operating permit; and (3) improvement in monitoring practices or relocation of monitors.

It is anticipated that once this pilot audit program has been completed, the results obtained may be utilized to help eliminate other similar TSP nonattainment areas in the Region.

b. Birmingham, Alabama

(1) Total Suspended Particulate (TSP) Nonattainment

As a result of a suit by U.S. Steel, Birmingham's (Jefferson County) particulate nonattainment area was redesignated on June 10, 1980, the changes to the boundaries made on June 24, 1981. The due date for submittal of the Part D plan for attainment of the particulate standard was June 10, 1981. The Alabama Air Control Commission submitted a draft Part D SIP for Jefferson County on July 14, 1982. EPA responded with comments on that draft on August 20, 1982, identifying the plan an unapprovable. Recently, the newly established Alabama Department of Environmental Management has agreed to submit a revised attainment plan with changes identified by EPA. The New Source construction moratorium presently applies in Jefferson County and has been in effect since December 10, 1982. The area is on the Tier II list of areas subject to sanctions.

The air quality in Birmingham has improved steadily over the last few years and is a vast improvement over the levels recorded there in the early 1970s. Violations of the ambient standard still exist despite the fact that several large industries, especially the iron and steel industry in Birmingham, have temporarily closed down most operations in the last couple of years due to poor economic conditions. With the projection of improved economic conditions and recovery starting in FY 83 and FY 84, the upturn in industrial activity and associated increase in emissions are expected to reverse the trend of improving air quality data in Birmingham. Unless the industry has perfomed maintenance or takes adequate precaution with the startup of their industrial operation and associated control equipment, there could be an acute air quality problem until the production and control equipment stabilize into normal operating conditions. EPA has recently obtained a contractor to assist EPA and the state in completion of the Birmingham and Etowah TSP Part D plans. It is anticipated that this effort will be completed with the state adopting or EPA promulgating a plan by the end of 1983.

(2) Ozone Nonattainment

Birmingham was designated nonattainment for ozone in March 1978 and required to develop and submit a plan for attainment of the ozone standard. The State of Alabama did develop and submit an attainment plan for ozone projecting attainment by December 31, 1982. Due to the elevated values of ozone recorded during 1982, EPA, Region IV does not anticipate that Birmingham can make the demonstration of attainment. The area is on the Tier II list of areas subject to sanctions.

Because Alabama has already adopted regulations for the control of major sources of VOC covered under Groups I and II of the CTG documents, a more in-depth analysis will have to be done in order to determine additional control requirements required to attain the ozone standard. A thorough investigation of the sources controlled and not controlled and their corresponding emissions must be prepared. The analysis to determine the most cost-effective emission reductions should include possible reductions from transportation control measures and a vehicle inspection and maintenance program. After a National policy is established for this type of situation, EPA Region IV can initiate work with the State to evaluate and develop the most cost-effective plan to bring about attainment of the ozone standard in Birmingham as expeditiously as practicable.

c. Southeast Florida - Ozone Nonattainment

Southeast Florida has a history of violating the ozone standard. Generally, ozone concentrations in the South appear to be declining at many ambient monitoring sites. In southeast Florida, the trends are downward, but ambient levels are still well above the standard in Dade County. In 1978, the three county area (Palm Beach, Broward and Dade) was designated nonattainment for ozone. Palm Beach and Broward Counties have sufficient data to demonstrate attainment, if considered separately. Since EPA policy is to consider an entire urbanized area as a single unit, ambient ozone violation of the NAAQS in Dade County would mean the entire three county area remained nonattainment. This area in on the proposed Tier II list of areas subject to sanctions.

One of the major contributors to the formations of ozone in the Southeast is emission from automobiles. Excessive rates of tampering/fuel switching contribute to this problem by introducing additional pollutants to the atmosphere. An EPA national survey has indicated Dade County has the second highest tampering/fuel switching rate of ten locations surveyed (22.3% compared to 16.7% national average). In recognition of this concern, EPA has awarded a grant to Dade County to investigate the tampering/fuel switching problem. The grant will provide assistance in (1) documenting tampering/fuel switching by taxicabs and private school buses; (2) assessing options in strategies to reduce tampering/fuel switching including development of a local ordinance prohibiting such action if the problem is verified by the study; and (3) increasing public awareness of the problems resulting from tampering/fuel switching. EPA will be assisting the County by providing technical expertise during the grant period. EPA Headquarters has announced recently that DIP credits and possible Section 105 grant monies will be available to State/local agencies for anti-tampering/fuel switching efforts.

The efforts in Dade County will be looked upon by EPA as a "pilot" program which may develop into a region-wide effort where high ozone levels are attributed inpart to tampering/fuel switching.

d. Louisville, Kentucky

Louisville is nonattainment for the following National Ambient Air Quality Standards:

Pollutant	National Ambient Air Quality Standards
Total Suspended Particulates	Primary and Secondary
Sulfur Dioxide	Primary and Secondary
Carbon Monoxide	*Primary
Ozone	*Primary

*Secondary standard same as primary standard.

(1) Ozone and CO Nonattainment

As a condition of EPA's approval of Louisville's Part D plan as part of the Kentucky SIP, Louisville was required to implement an I/M program to reduce hydrocarbon and carbon monoxide emissions. The program was not in place as of December 31, 1982. The local agency adopted vehicle inspection and maintenance regulations in January 1983 and has scheduled startup for July 1, 1983 (although January 1, 1984 is more likely.) Vehicle inspection maintenance is necessary to attain standards by 1987 for both carbon monoxide and ozone and thus Region IV will make every effort to ensure the startup of the I/M program in a timely fashion. The 1981 monitored carbon monoxide concentrations were approximately equal to the 1977 figures, further emphasizing the need of the vehicle inspection program. The ozone analysis indicates ambient monitoring figures slightly below the standard, but this is not considered part of a downward trend, since in previous years the maximum readings have fluctuated up an down in alternate years.

(2) Total Suspended Particulate Nonattainment

The County is on the Tier II list of areas not expected to have attained the TSP standard by December 31, 1982.

The total suspended particulates emissions inventory and attainment strategy for Jefferson County should be updated. The 1981 Reasonable Further Progress report for this are does not indicate Reasonable Further Progress toward attainment. The total suspended particulates emissions line is above and diverging from the Reasonable Further Progress line. The emissions inventory and control strategy update must be planned in light of the impending change to the particulate ambient standard. Resources required to perform the update may differ considerably, depending on which standard is targeted, the present total suspended particulates standard or the impending inhalable particulate standard.

(3) Sulfur Dioxide Nonattainment

The nonattainment problem in Jefferson County is mostly due to emissions from Louisville Gas and Electric coal-fired power plants. The plants account for 91% of the total sulfur dioxide emissions. The 1981 report for this area does not indicate Reasonable Further Progress toward attainment. The total sulfur dioxide emissions line is above and diverging from the Reasonable Further Progress line (1981) total emissions 141,600 tons per year; attainment at 90,200 tons per year. Each unit should be in compliance by January 1, 1985. The area will probably be attainment before 1985 due to installation and startup of two retrofitted flue gas desulfurization units in 1982.

The Air Pollution Control District of Jefferson County is considering the possibility of redesignating portions of the County to attainment for total suspended particulates and sulfur dioxide in areas where ambient monitors indicate attainment. The remaining portions which are nonattainment are unlikely to attain the standards without additional measures taken, such as installation of Flue Gas Desulfurization.

Resolution of the nonattainment strategy for Jefferson County will require Headquarters aid in securing contractual assistance for portions of work. Achieving the National Ambient Air Quality Standards for the four applicable pollutants will require considerable Regional resources to ensure attainment of the standards in an expeditious manner. Region IV must be prepared to provide technical assistance to the local agency and to provide review and approval of proposed attainment strategies.

e. Knoxville, Tennessee - Carbon Monoxide Nonattainment

Knox County has been designated nonattainment for carbon monoxide with a 1970 Census under 200,000, the State was not required to submit control measures in 1979 under the Clean Air Act requirements. Monitoring data indicate that reliance on the Federal Motor Vehicle Control Program will not bring Knox County into attainment. The area is on the Tier II list of areas subject to sanctions.

Under the new census, Knox County is now over 200,000 population and thus the State may be required to prepare and submit a State Implementation Plan revision pending guidance from EPA and/or Clean Air Act revisions. Guidance on the exact State Implementation Plan requirements and schedule of activities will be necessary from Headquarters. Without guidance, the State will be hesitant to develop an action plan. The State has expressed an urgent need for guidance, particularly in light of the proposed sanctions for this area.

f. Coal Conversions at Florida Power Plants

Florida is highly dependent upon fuel oil for generation of electricity. Fifty percent of the generating capacity in the State uses heavy fuel oil as the primary fuel. Due to uncertain supplies and prices, the two largest electric utilities in Florida, Florida Power and Light and Florida Power Corporation, are evaluating conversion of at least eleven units, totalling 4000 MVm from oil to coal fuel. These units consume about 24 millions barrels per year of No. 6 fuel oil. Present actual sulfur dioxide emissions from the eleven units are approximately 231,000 tons per yer. After conversion to coal, the actual emissions could be over 700,000 tons per year depending on interpretation of present State law, 1981 capacity factors and the State Implementation Plan limit of 6.17 lb/MM BTU. This increase would create a tremendous burden on Florida's air quality. This burden is in addition to that created by a recent State Implementation Plan relaxation allowing a one and one-half times increase in oil-based sulfur dioxide emissions from most of Florida Power and Light's generating units.

Region IV, in conjunction with the Florida Department of Environmental Regulation, will be deeply involved with this project. In the beginning stages, a number of policy questions concerning regulatory applicability must be addressed. Resolution of Prevention of Significant Deterioration and New Source Performance Standards applicability has already begun. As applications are being prepared and submitted by the utilities (one permit application is under review now), EPA will concurrently review each permit application with the State. There will probably be public hearings associated with many of the conversions. Florida's reliance on tourism as a major industry and its large population of elderly people, cause public participation in an any environmental relaxation to be greater than in most States. Florida is planning to adopt a fuel conversion rule to accomodate the coal conversions. Significant resources will need to be devoted to rule preparation and review, evaluation of environmental impacts and participation in public hearings. Four of the units will impact Everglades National Park, and conversion will necessitate coordination with the National Park Service. If Florida Power and Light applies to increase emission at those units it can be expected to apply for Class I variance, creating additional public involvement.

The Department of Energy is studying these plans for possible issuance of fuel conversion orders. If this occurs, experience has shown that EPA will be extensively involved in negotiating the conditions needed to insure compliance with National Ambient Air Quality Standards, Prevention of Significant Deterioration increments and emission standards.

Under any scenario for fuel conversion, EPA will need to devote significant technical resources to the overall project, including air quality modeling, air monitoring plans, control equipment specification review, determination of appropriate emission limits, and assurance of compliance.

SYNTHETIC FUEL FACILITIES

1. Introduction

Region IV is expected to continue to be one of the more active areas of the country for the proposed development of synfuel facilities. Presently there are 12 projects in Region IV under active consideration for financial assistance of the Syntethic Fuels Corporation (SFC). (Figure SF-1)

There is no typical synfuel project and indeed many of the processes used with the synfuel proposals are not new. The problem is that the processes are being used and connected together in new ways such that the operation and waste emissions are not reliably known. This causes an uneasy feeling on a large part of the public that waste emission from synthetic fuel projects may cause irreparable harm to people and the environment.

The Energy Security Act (ESA) established the U.S. Government policy to support development of a U.S. Synthetic Fuel Industry. The EPA role in support of this policy is to insure, through consultation with SFC and their applicants, that the industry develops in an environmentally safe manner. The mechanism for this consultation is Section 131(e) of the Energy Security Act which calls for SFC applicants to prepare environmental monitoring plans (EMPs). The conference committee report describes the EMP as helping to characterize and identify areas of concern and develop an information data base for the mitigation of problems associated with the replication of synthetic fuel projects.

2. Active Projects in Region IV are:

a. Peat Methanol Associates (PMA)

The sponsors propose to initially harvest peat from 15,000 acres on the Pamlico-Abermarle peninsula of North Carolina and will use a KBW gasifier to produce 4600 BPD of methanol in 1985.

b. North Alabama Coal Gas

This coal liquefaction project to be located at Murphy Hill, Alabama was orginally developed by TVA. The sponsors expect to produce 28,000 BPD of methanol in 1986.

c. Kensyntar

This tar sands project has mineral leases for 17,000 acres near Mammoth Cave National Park, Kentucky., A pilot project is in operation now; however, full scale production of 10,000 BPD of heavy oil would not be achieved until 1987.

d. Mid South Synfuels

This industrial fuel gas project would convert 3100 tons of coal to 167 MCF gas per day at Memphis, Tennessee.

e. Breckinridge

This H-coal facility was mainly sponsord by Ashland Oil Company at Breckinridge County, Kentucky. Coal would be converted to 25,000 BPD of oil equivalent products.

f. W. R. Grace

This coal liquefaction project at Baskett, Kentucky would convert 7700 TPD to 12,500 BPD gasoline beginning in 1988.

g. SRC-1

This direct coal liquefaction facility at Newman, Kentucky would convert 6000 TPD coal in the equivalent of 20,000 BPD oil derived fuels and energy products.

h. American Syn-Crude Project

This oil shale project, located in Olive Hill, Kentucky, is proposing to produce shale oil using the "Petrosix" technology. Construction would begin in 1985, with start-up scheduled for 1989.

i. Means Oil Shale Project

This oil shale project is located in Montgomery County, Kentucky. Southern Pacific Petroleum and Central Pacific Mineral are joint sponsors who propose to extract oils from eastern shale to produce 13,440 barrels of upgraded shale oil per day. Full operation of the plant is scheduled for the second quarter of 1988.

j. Tennessee Synfuels Associates Projects

This coal liquefaction project is located in Oak Ridge, Tennessee. Koppers Synfuels Corporation proposes to convert coal to gasoline using KBW gasifiers, M.W. Kellog methanol synthesis an the Mobile MTG catalytic process to produce gasoline. The project will produce 10,000 BPD oil equivalent product. Initial production is scheduled for 1987.

k. Falcon Sciences Project

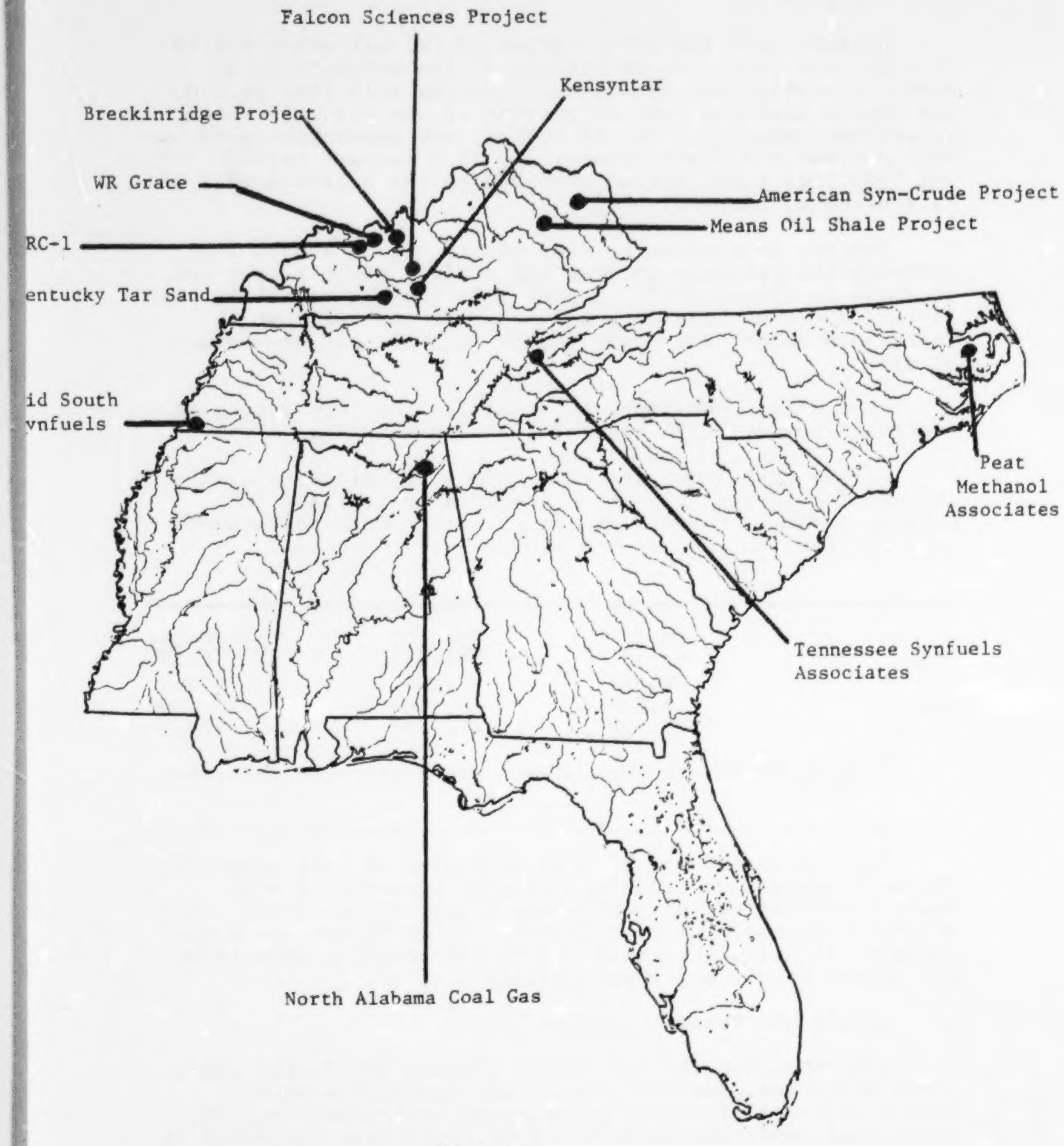
This tar sands project in Butler County, Kentucky will produce 2000 barrels of oil per acre per year.

l. Kentucky Tar Sand Project

This tar sands project in Logan County, Kentucky is sponsored by Texas Gas Development Corporation and will produce 5000 BPD of heavy crude oil. Construction is shceduled to begin in October 1983 with start up in late 1986.

REGION IV

ACTIVE SYNFUEL PROJECTS


Falcon Sciences Project
Kensyntar
Breckinridge Project
WR Grace
American Syn-Crude Project
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Methanol
Associates
Tennessee Synfuels
Associates
North Alabama Coal Gas

Figure SF - 1

ELECTRIC POWER GENERATION

1. Introduction

Between 1970 and 1981, Region IV led all other Federal Regions with just over 20 percent of the nation's total electric utility net generation. During this time period, the Region also had over 20 percent of the nation's total generating capacity. In the region, net generation grew by 64.3 percent and plant capacity by 95.3 percent between 1970 and 1980 (See table below) compared to the nation's 49.3 and 79.9 percent, respectively.

The net generation by fuel source mix in Region IV reflects the reliance on coal and nuclear power plants and is shown in Figure EP-1. Region IV's net generation by oil is influenced by Florida's heavy use of fuel oil, which represents about 88 percent of the Region's net generation by oil.

Fossil fuel consumption (primarily coal) in Region IV increased between 1970 and 1980, as shown on Figure EP-2.

Figure EP-3 shows the projected power plant capacities in 1990 for Region IV. The extraordinary increase in nuclear capacity relates to its operating cost advantage over the fuel sources in the region.

	1970 Capacity	1980 Capacity	% Increase
Coal	65,096	99,483	52.8
Oil	26,823	28,313	5.6
Gas	5,639	0	0
Nuclear	15,908	47,770[1]	200.3

[1] Adjusted for nuclear plant cancellation or deferment.

The increasing use of coal in Region IV will compound the acid deposition problem. Limited research of acid deposition's effect on coniferous trees indicates that the extensive acreages of pine forests in the Region can suffer damages; if true, this will create far-reaching impacts on the Region's pulp and paper industry.

2. Intake and Thermal Impacts

More than 100 thermal impact studies (conducted under Clean Water Act, Section 316(a), and applicable Water Quality Standards) and/or entrainment/impingement studies [conducted under CWA Section 316(b)] have been conducted at power plants in Region IV. With a few exceptions, environmental impacts associated with these facilities have been found to be within an acceptable range. In general, plants with the most significant impacts are found at shallow estuarine sites as compared to fresh water or open ocean locations. Considering the projected capacity increases, thermal pollution and intake effects will be of continuing concern unless plants are carefully sited to avoid impacting critical estuarine environments.

3. Selenium

The selenium "problem" has become apparent at two existing plant where fly ash is sluiced to an ash pond, which discharges to a small cooling lake. Since the source of ash sluice and cooling water at each plant is its cooling lake, considerable recirculation occurs with limited outflow from the lake. Because of the intake and discharge of ash sluice water from the lakes, lake water has increased in selenium (also arsenic and metals) concentration. Company data indicate that continuous exposure to extremely low levels of selenium (significantly less than 0.01 mg/l) results in a buildup of selenium in fish tissue through the food chain to a point where fishery reproduction is seriously reduced or eliminated. Steps to reduce this problem are underway at one of the plants. Continuing studies are underway at the second plant, and were recently instituted at another similar plant when it became operational. Region IV and state agency representatives have been involved in development and implementation of these studies.

Note: The Electric Power Research Institute also has similar studies underway (and is participating in those in Region IV), since the problem is surfacing elsewhere in the U.S. (particularly in Region VI) where ash sluicing and/or air fallout of selenium from burning lignite coal is causing similar problems in adjacent small lakes.

Percent of Net Generation by Fuel Source, Region IV
1970 - 1980

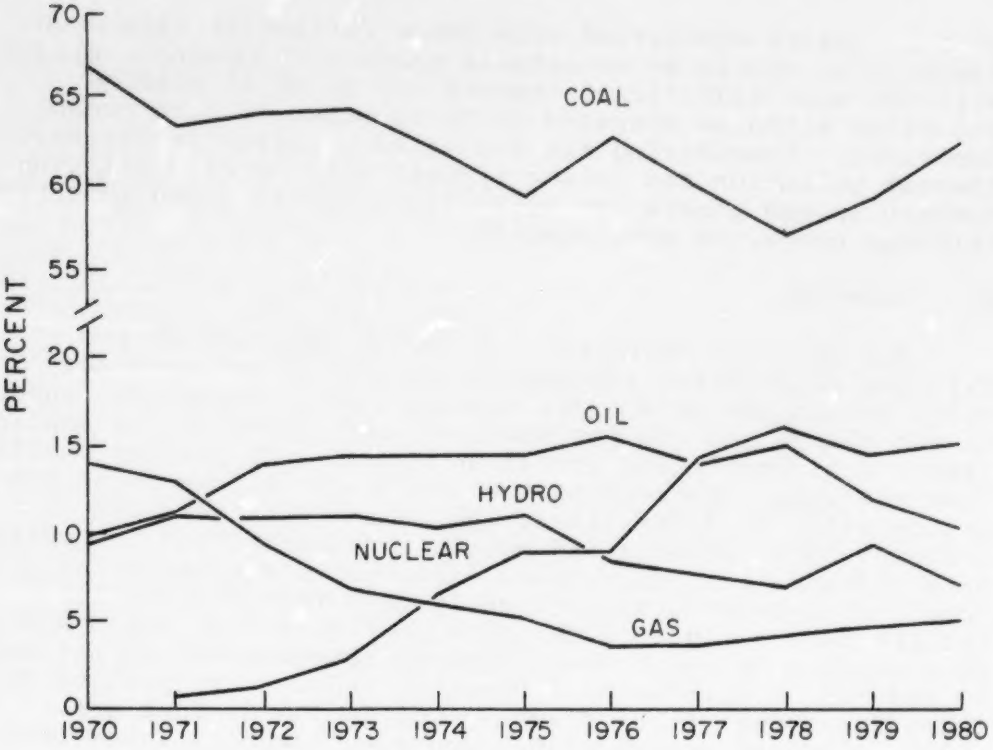


Figure EP - 1

Fossil Fuel Consumption , Region IV, 1970 - 1980.

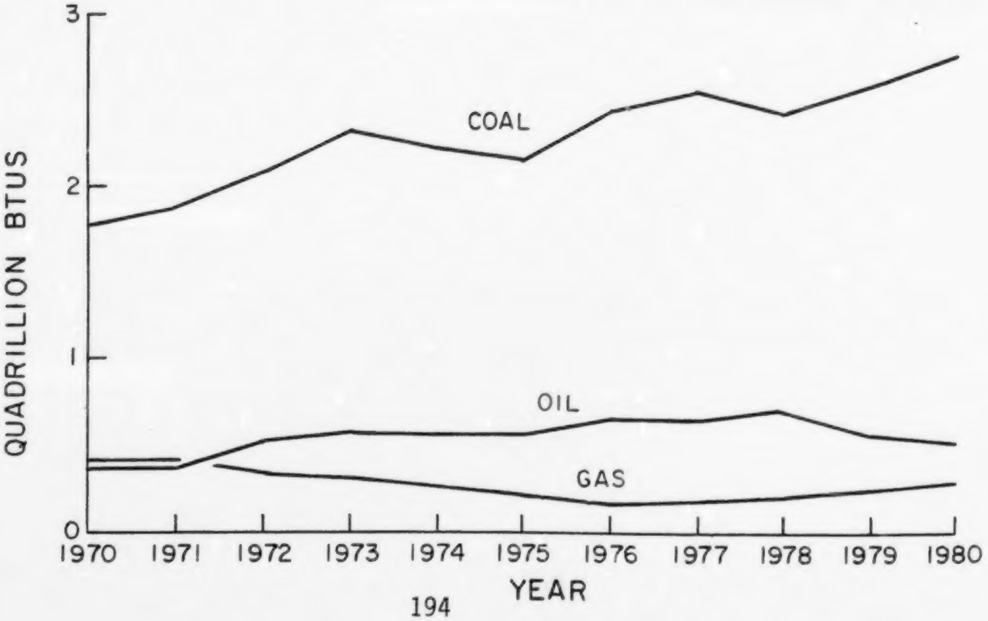
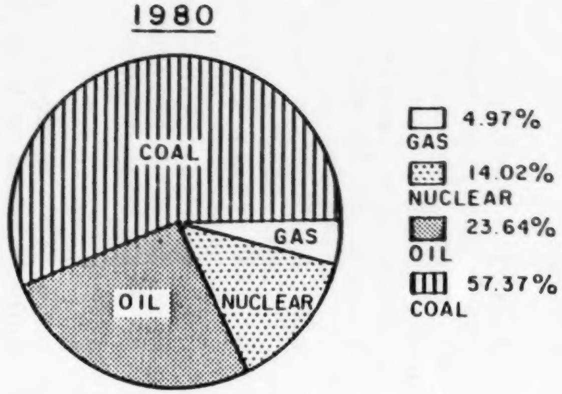


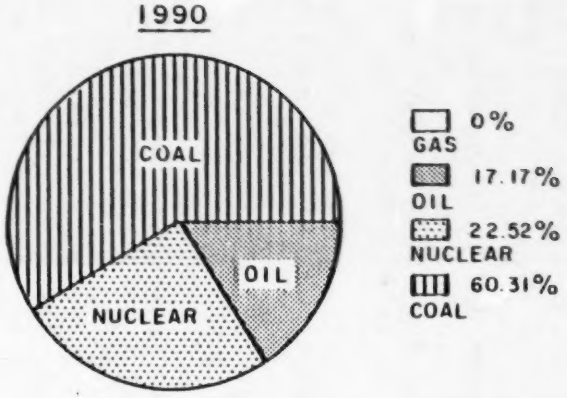
Figure EP - 2

UTILITY GENERATING CAPACITY (MEGAWATTS)



OIL	26823 megawatts
GAS	5639
NUCLEAR	15908
COAL	65096

UTILITY CAPACITY (MEGAWT)
TYPE ENERGY SOURCE 1990



OIL	28313
GAS	0
NUCLEAR	37137
COAL	99483

Figure EP - 3

THE BISCAYNE AQUIFER

1. Description

The Biscayne Aquifer, a designated Sole Source aquifer, underlies the southeastern tip of peninsular Florida including Dade, Broward, and the southeastern tip of Palm Beach County. It is a wedge shaped body of highly permeable limestone and sand which extends from land surface to a depth of more than 200 feet along the coast and thins out completely 40 miles to the west under the Everglades. The aquifer is unconfined and is recharged primarily by rainfall. Water levels in the aquifer, which are close to the surface, respond to and are in direct connection with suface water bodies such as canals and lakes.

A combination of factors has combined to create a drinking water quality dilemma in the Biscayne Aquifer: a groundwater table several inches to several feet below the surface; a thin aquifer resulting in shallow water supply wells, large amounts of rainfall to transport surficial contamination and a relatively flat, porous ground surface with several million people and associated domestic, commercial and industrial activities at its surface. This area is one of the most vulnerable to groundwater contamination in the Region, and is the most significant problem in terms of the number of people impacted. Prevention of groundwater contamination and clean-up of existing contamination in the Biscayne Aquifer are difficult problems with no easy solutions; however, the high stakes involved in terms of public health impacts warrant serious consideration and action by the agency.

2. Drinking Water Dilemma

In 1974 EPA conducted a National Organics Reconnaissance Survey (NORS) which analyzed water in 80 cities for organic constituents. Miami, which was one of the cities chosen, had the highest level of chloroform (311 ppb) of any city, in addition to detectable levels of 34 other volatile organic compounds. A total of 76 organic compounds of all types were detected. The samples which yielded these results were taken from the Preston well field, one of the major water supplies in Dade County. A follow-up study which was performed by the Region confirmed the findings of the NORS. The results showed that some of the organics were formed in the treatment process (trihalomethanes) but also that many organic compounds were present in the raw water and passed through the treatment process with little or no change in concentration.

These findings prompted the County to use part of their 208 grant money to conduct an area-wide survey of drinking water supplies. Raw water was collected from 216 wells across the county representing approximately 66 different water supplies. The samples were analyzed for 15 different volatile organic chemicals; a number of them are known or suspected animal carcinogens. The results demonstrated that widespread, low level contamination exists across much of Dade County. Only 10% of the wells were completely free from contamination. Traces of contamination (less than 1 ppb) were found in approximately 50% of the wells. While these levels are not of an immediate health-related concern they do indicate the susceptibility of this aquifer system to man-made domestic, industrial or commercial contaminants and the potential for higher levels of contamination depending on the activity at the surface.

The results of the survey also demonstrated that significant contamination existed in certain wellfields or individual wells. Forty percent of the wells studied contained between 10 ppb and 223 ppb for the combined total of all 15 volatile organic chemicals. The Preston/Hialeah system was determined to be one of the most contaminated water supplies. The Preston and Hialeah wellfields, which are located in the same general area of Miami, are connected to two separate water treatment plants, but the plants are interconnected and are considered as one unit. This system supplies water for approximately 750,000 consumers. All of the wells in the Preston wellfield and 15 out of 23 wells in Hialeah contained between 10 and 175 ppb total of the 15 volatile organic chemicals. The results of the survey also demonstrated that 11 out of 20 wells supplying the Sunny Isle water treatment plant in North Miami Beach contained totals between 10 and 223 ppb. At least 5 other water systems were shown to have significant contaminations and a number of single wells included as a part of a larger water supply system demonstrated levels of concern. It is important to note that these samples were raw water samples which did not reflect the total trihalomethane (THM) concentrations. In many cases in Dade County, the total THM would increase significantly the total volatile organic concentration occurring in the water supply.

A follow-up study implemented by Dade County on the Preston/ Hialeah area demonstrated that land uses characterized as industrial or commercial are associated with higher levels of synthetic organics in the underlying groundwater. In the case of Preston, Hialeah, North Miami Beach, and probably many of the impacted wells, this observation may explain the occurrence of these chemicals in the groundwater.

A more recently discovered contaminated well supply is the Medley wellfield which is located to the north of the Preston wellfield and on the edge of an industrial/commercial area, as well as directly west of a listed Superfund site. It is used to supplement water supplies at the

Preston water treatment plant, In the first half of 1982, Medley wells #3 and #2 together were pumped an average of 408 hours per month or 17 full days per month. In May, 1982, Medley #3, which is pumped most frequently, contained 210 ppb volatile organic chemicals, and in September it contained 122 ppb including vinyl chloride, dichloroethylene and dichloroethane. (The September data may not include a complete survey of all volatile organic chemicals). Water from the Medley wellfield is mixed with water at the Preston Plant before it is distributed. At one point, complaints by consumers of taste and odor problems coincided with the introductions of Medley water into the system. This event generated local press coverage and prompted the Region to write the Florida Department of Environmental Regulation requesting that Medley be taken off-line as soon as possible.

In September of 1982, finished water from the Preston water treatment plant contained levels of vinyl chloride, dichloroethylene, tetrachloroethylene and dichloroethane in excess of the one in a million cancer risk for lifetime exposure to these chemicals. But even though county officials are concerned about the health implication of these chemicals, they do not have the luxury of abandoning a wellfield or even the most contaminated wells such as those in Medley. Water shortages occur during dry periods which require the use of most water supply wells. The only option they have is to drill new wells to replace the contaminated supply wells. A new wellfield containing approximately 15 wells, which is located in a presently undeveloped portion of the county, is in the final stages of construction and should be on-line this year. At that time, they will reduce their dependence on the Preston/Hialeah wells (and reportedly discontinue the use of Medley). While this is seen as a major remedial action that is urgently needed, it is not seen as the end to the problem. Growth in the area will demand that more and more water from the Preston/Hialeah wellfields be provided. Also, intense commercial and industrial development pressure for land within the cone-of-influence of the new wellfield is occurring which may result in degradation of the new supply.

Last year, an EPA contractor sampled and analyzed approximately 13 water samples from the Biscayne Aquifer as part of the national Groundwater Supply Survey. All six community water supplies in Broward County were found to contain traces of contamination, but only one, the City of Hallandale, contained levels of volatile organics which prompted EPA to notify the community that use of two of the wells should be discontinued and another monitored on a frequent basis. All six supplies in Broward County contained total THM concentrations above 100 ppb, the EPA standard. Of the five community supplies sampled in Dade County, only one was found to contain significant contamination to prompt EPA to recommend that two of the wells be monitored on a frequent basis. The one supply in Palm Beach County within the Biscayne Aquifer was free of contamination. The Groundwater Supply Survey is discussed in more detail in a discussion of organic contamination in the Drinking Water Section of this report.

Recent data obtained by the Region indicate that the City of Ft. Lauderdale's water supply is threatened by vinyl chloride contamination. Use of several wells in the most eastern part of the wellfield has been discontinued due to levels of vinyl chloride as high as 554 ppb. The City is in the process of addressing remedial measures at this time.

Synthetic organics are not the only type of contamination occurring in the Biscayne Aquifer. Bacterial and viral contamination of the groundwater can occur in localized areas. Two epidemics, typhoid and gastroenteritis, were reported in 1973 and 1974, respectively. Also, agricultural practices have contaminated the groundwater with nitrate in portions of the agricultural region of South Dade.

3. Sources of Contamination

Seven hazardous waste sites listed on the National Superfund Priority List are located on top of the Biscayne Aquifer. All have contaminated the groundwater to varying degrees. Four of these, Gold Coast Oil, Miami Drum, the Varsol spill and the 58th Street Landfills are located in the immediate vicinity of the Preston/Hialeah wellfields. A Superfund study is in progress to determine the full extent of the impact on the groundwater system from three of these sites. One of the other hazardous waste sites, Hollingsworth Solderless Terminal Company, is located within the cone of influence of Ft. Lauderdale's wellfield where use of several wells has been discontinued due to vinyl chloride contamination.

Other hazardous waste sites not occuring on the national Priority List such as a wood preserving facility and a battery recycling facility have contaminated the groundwater. Other sites are just being discovered such as the Pepper Steel and Alloy Company that disposed of used transformers on the ground resulting in suspected PCB contamination of the groundwater.

There are a total of 265 hazardous waste facilites in Dade and Broward County which notified the Agency in response to the RCRA requirements. Only 9 of those are disposers; however, any facility handling hazardous waste holds the potential to contaminate the groundwater as a result of spills and leaks.

Areas of concentrated industrial and commerical establishments are another source of contamination to the aquifer. These areas are characterized by many different types of activities ranging fom manufacturing plants to laundromats to automobile salvage operations. While most of these facilities probably do not use large quantities of hazardous or toxic chemicals, many of them may use small quantities of a variety of chemicals, solvents being one class most commonly used. Some of these areas are unsewered and use septic tanks or french drains for their wastewater disposal. This type of disposal mechanism provides the most direct path of contamination into the aquifer system. Contaminated surface drainage from production areas onto the ground, or spills and leaks, or leachate from solid waste disposal areas could also result in introduction of contaminants into the aquifer.

Outside of the industrial and commercial areas, sources of groundwater contamination may include wastewater disposal in the form of septic systems, percolation ponds or spray irrigation fields. Stormwater runoff could potentially enter the aquifer through rock pit lakes or (borrow) ponds and cause quality degradation. Use of agricultural chemicals has caused problems in certain areas. Any spill or leak is likely to cause some degradation of the groundwater.

4. A Step Toward Unified Action

Continued assaults on the Biscayne Aquifer threaten its usefulness as a drinking water supply. While federal, state and local governments have taken steps individually to reduce these attacks, the continued viability of this sole source of fresh water for over 3 million people cannot be entrusted to a splintered approach. The affected counties and all branches of state and federal government must have a common plan to guide their actions. The stakes are too critical to allow piecemeal actions to alternately protect and degrade the aquifer. Recognizing that this situation cannot be allowed to continue, Region IV proposes (subject to Headquarters approval) to develop a management plan for the protection of the Biscayne Aquifer. Several federal, state and local agencies have agreed to join in this task. The final report would present a preventative action program with specific guidelines for the protection of the Biscayne Aquifer potable water supply.

PESTICIDES

1. Pesticides Contaminating Groundwater

Emerging problems may be identified in a number of areas. The inability to be able to perfectly forecast biological degradation and movement of pesticidal compounds under all environmental conditions (soil type, moisture, temperature, light, etc.) could lead to these compounds or the metabolites showing up in unexpected places. Certain organophosphates may be found to appear in groundwater where applications were assumed to be made with very little such risk. The same may be said for chlorinated hydrocarbons and carbamates. Consequently, the contamination of groundwater and drinking water is a valid concern of everyone and Region IV has not escaped this problem. A program of groundwater monitoring conducted by industry and various departments of state government was implemented recently in Florida when residues of aldicarb showed up in water samples. While no residues of aldicarb have been found in citrus products entering commerce, contamination has been found in drinking water wells surrounded by citrus groves that had received treatments with the chemical. The findings led to a statewide ban on TEMIK use, pending more extensive testing and analysis.

Groundwater contamination and monitoring issues were also the basis of the DBCP Section 18 exemption request and ultimate request for withdrawal in South Carolina. The Agency refused to withdraw its approval of the exemption. The State identified its inability to perform the proper groundwater monitoring program (certain State and private individuals had voiced concern over leaching and contamination) as justification for withdrawal request action.

Major concerns were raised for some individuals in isolated areas of North Carolina with regard to contamination of water supplies from picloram. Because much of the reporting of these incidents involved unsubstantial claims of health effects, no new formal action has been taken by any governmental body regarding the compound. However, it is viewed as a problem for Region IV in the entire context of groundwater contamination. Pivot irrigation utilizing chemicals (chemigation) is a new potential source of groundwater problems. This is particularly so because even though the practice is becoming more common, only one state (Georgia) has a requirement that anti-siphon devices be made a part of the irrigation system.

2. No Till Cropping and Payment in Kind - Changes in Pesticide Use Patterns

This pesticide use is balanced by a benefit to the environment. Reduced erosion saves both the nutrients applied as well as the cropland, giving rise to both immediate and long-term savings to the farmer. In addition, minimizing erosion reduces the greatest quantity of pollutants in surface water, namely sediment. It is estimated that by the year 2000, 65% of all major crops will be produced utilizing a no till farming system. The payment-in-kind (PIK) acreage diversion plan announced by the U.S.

Department of Agriculture could also lead to increased uses of herbicides and possibly insecticides. One industry expert forecasts participation in PIK at 20-23 million acres in 1983. In part, participation in PIK requires that weeds be controlled on the diverted acres and that sufficient cover be allowed to prevent loss from erosion. Specifying weed control on the diverted acres is sound business. Vegetation growing on the non-cropped land provides a good habitat and alternate host for insects or potential crop diseases. Consequently increased herbicide use for weed control may necesarily be accompanied by increased use of insecticides or fungicides.

The use of herbicides may be expected to increase markedly in the near term. If used properly and in accordance with label direction, the use of these herbicides should show a considerable benefit to the environment. No till crop production is expected to increase by several hundred thousand acres in Region IV. No till cropping may reduce sheet and rill erosion by 50-90%. Sheet and rill erosion is responsible for the majority of soil erosion in Region IV. To achieve this reduction through no till cropping could result in a 20 to 35% increase in herbicide application.